HOMEMADE

CONSTRUCTING THE

GRENADE

ULTIMATE

LAUNCHERS

HOBBY WEAPON

RAGNAR BENSON

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Homemade Grenade Launchers: Constructing the Ultimate Hobby Weapon
by Ragnar Benson

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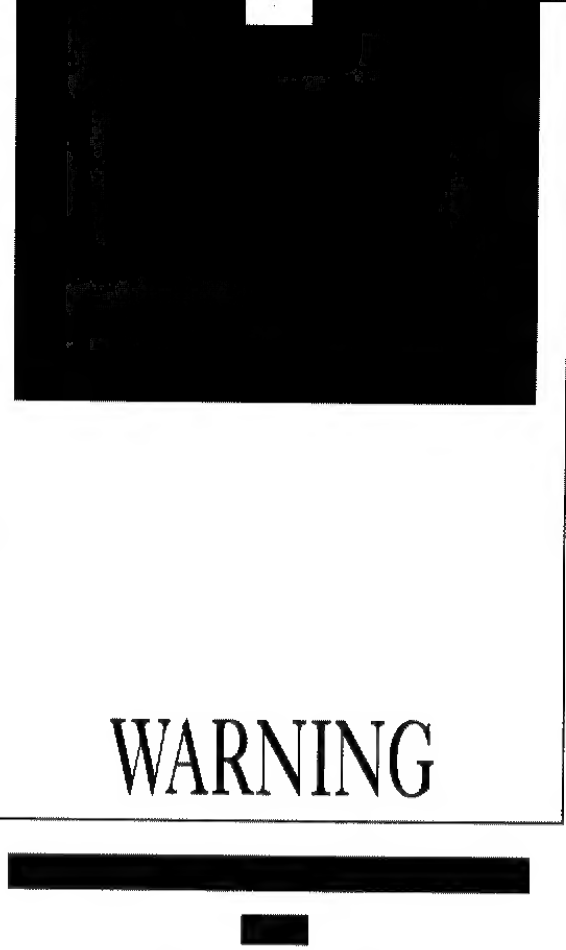


WARNING

The procedures in this manual and the resulting end product are *extremely dangerous*. Whenever dealing with high explosives and improvised weaponry, special precautions should be followed in accordance with industry standards for experimentation and production. Failure to strictly follow such industry standards may result in harm to life or limb.

Therefore, the author and publisher disclaim any liability from any damages or injuries of any type that a reader or user of information contained within this manual may encounter from the use of said information. Use this material and any end product or by-product at your own risk. ***For information purposes only.***

PREFACE

Once upon a time in this land of the free and home of the brave, it was perfectly acceptable to own and operate large-bore firearms of a military nature. So long as no one was damaged in the process, the good citizens of the land allowed us the right to our chosen hobby. We fired our military weapons right out in the open, where anyone could watch.

As time went by, we obviously were having so much fun at our weekly blasts that other similarly inclined gun nuts aspired to join in the festivities. Impartial, unbiased observers—perhaps from another planet—might have concluded that our passion for throwing an explosive charge out a fifth of a mile onto a dirt field, where it roared off with a throaty thump, was absolutely ridiculous. These same observers would, if they were consistent in their logic, have made similar conclusions regarding the game of golf.

As time went by, many more like-minded enthusiasts attached themselves to our group. We found that we were not alone in our appreciation of the operation of large-bore military weapons. Each newcomer brought along his version of fantasy, thus enriching us all with the smell of the smoke and shock of the blast.

Robin Miller owned a fine 81mm Finnish mortar. It was new in the box when he bought it. Mr. Miller discharged it using custom-loaded 12-gauge blanks as a propellant. A few loaded with 35 grains of Herco virtually blew the projectiles off the playing field.

Finnish armorers apparently had us gun nuts in mind when they designed this particular mortar. It could be drop fired or discharged with a lanyard. Miller used old 16-ounce vegetable cans half filled with concrete as projectiles. Later on he got a bit more rowdy and started making projectiles with a stick of dynamite and 10-second delay fuze. Fast 60-percent dynamite vaporized the can and concrete, nicely marking the location of the projectile. We never did attempt point-detonating rounds. Our fuzed rounds were much safer and, even if it had been in a military context, no one was going to throw them back.

Dennis Stover purchased a brand-new Lahti 20mm antitank rifle along with two 125-round cases of ammo. He kept four or five extra magazines loaded up and, whenever the occasion demanded, could really lay down the firepower. In fact, muzzle blast from this outrageous, monstrous rifle killed all the mosquitoes in the region and damaged low-flying ducks and geese. But glory had its price. Dennis spent almost $100 for the entire outfit—a sum we judged to be most princely at the time.

Ted Terrel, a poor struggling college student, could afford nothing more than a case of rifle grenades. He bought the grenades from Val Foget at

Navy Arms and fired them from a borrowed AR-15 rifle. At the time, a case of forty-eight grenades was a mere $17, proving that the old adage, "It isn't what you spend but how you spend it," is what counts. Terrel demonstrated that under many circumstances he could shoot his big-bore weapons with as much accuracy as the rest of us. We fired our ordnance out across a gently sloping 40-acre cornfield. About 300 yards out we circled a white clothesline on the ground as an aiming point. Using nothing more than Kentucky windage, he put his rifle grenades in the 10-yard circle with as much frequency as anyone.

Of course the 20mm Lahti delivered with pinpoint accuracy, but the rounds were not HE (high explosives). When they got to the target, the effect was not as inspiring as the others.

Larry (Ted's younger, more affluent brother) started bringing his .55-caliber BOYES antitank rifle. He did well with it, but ammo always was a problem. He later rebarrelled it for more commonly available .50-caliber machine gun ammo, allowing him to shoot until his shoulder melted.

Ron Brooke had an operational World War II 3.2-inch bazooka but was constrained by a severe lack of ammo. Over the years we managed to scrounge a few original HE rounds, but bazooka rounds were always scarce, even back in the Good Old Days. And contrary to what one may see in the Rambo movies, they are extremely difficult to manufacture at home.

There were others . . . but lest I fail to preserve a few trees for use by the gun-hating liberal press, I must press on to the main point.

Other than a few chickens living a couple of miles away that we literally scared the shit out of, we did nothing except entertain ourselves and the growing collection of rubberneckers who drove out to watch the fireworks. Some even recall a round of applause following an especially skillful discharge.

Eventually I went to Interarmco in Alexandria, Virginia, and purchased an 800-pound French Peteaux 25mm cannon. It was almost brand-new, complete with half-inch Class A armor plate and rubber tires. Cost was $45 for the cannon and $45 to truck it home. My friends virtually died of apoplexy upon hearing that factory ammo was $1 per round!

From the instant it was delivered, the cannon was a roaring success. A truck driver who claimed to be too bored and too busy to deliver it to our farm and an indifferent neighbor with a high-reach hydraulic unloader spent the first afternoon of my ownership playing with the thing. Four hours later, after an emergency meeting that took me to town, I found them still happily spreading out the trails, lowering the spades, releasing the breechblock, and turning the traverse mechanism. The pair had come over at my request, duty bound not to be fascinated, but here they were, still playing with it like nothing else in the world mattered.

After I steam-cleaned away the fossilized Cosmoline and my wife painted it up smartly, this problem grew more intense. So many people drove out from town to see the cannon that we were forced to chain it to a tree for fear someone might try to tow it away.

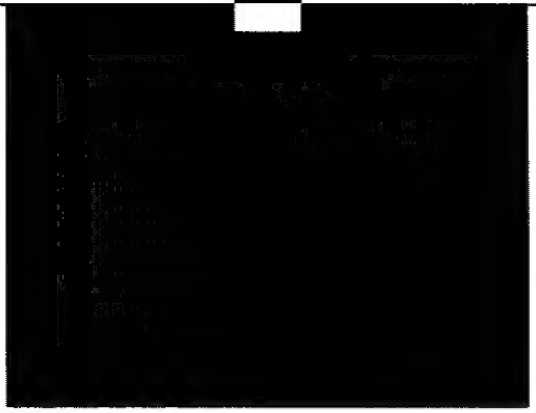
Our entire collection of ordnance, we discovered, held great fascination for the average man in the street. It was like owning a snowmobile: if tinkering with the machine isn't fascinating, then ownership is not much fun.

We tinkered in two realms. For the most part, the large-bore ordnance we owned was either new or in very good condition. We seldom were forced to tinker to "get the machine to run." Instead our tinkering was directed toward finding out how, sans training or field manuals, to best use the ordnance. The second component of our play involved manufacturing the ammo necessary to enjoy our hobby.

As a result, we became something of experts at hand loading rounds for the Peteaux and other large bores. I even had a bullet mold and neck-size die made, allowing me to produce complete ammo. Our mortar crew eventually perfected HE rounds, and our rifle grenade shooter even conjured up some of his own grenades. The only failure occurred with the bazooka, due perhaps to our lack of persistence.

Today there is a remnant of interest throughout the land in shooting big-bore weapons. The

ground rules have been changed slightly, precluding one from doing so openly, and requiring that both ammo and firearm be manufactured at home. Nevertheless, despite suppressive federal and state legislation, the interest and enthusiasm are still there.



INTRODUCTION

Federally licensed dealers in destructive devices report that there is a tremendous resurgence of interest in large-bore mortar and grenade-launcher-type weapons throughout the United States. Interest in these firearms peaked once before, just prior to the 1968 gun act that made it tough to own and operate military weapons.

Even at steep $1,000-per-year license fees, the number of legal dealers has increased dramatically as well. As recently as two years ago, there were only a couple throughout this country. Now there are scores and scores of dealers willing and able to legally sell mortars, cannons, and grenade launchers.

Things are also changing out on the shooting range. Owners who once unlimbered their .50-caliber machine guns expecting large, appreciative audiences are coming up short. Interest at military shoots now centers around M79s, M203s, and the likes of the occasional 37mm Bofors cannon. There is almost universal agreement that the cutting edge of firearms one-upmanship has shifted to the spectacular big bores. Owners and spectators alike are fascinated with arms that deliver a round on target in a colorful manner, and eight ounces of high explosive resolutely thumping is colorful.

During the 1970s and 1980s, military weapons designers did all of us a favor when they came up with the 40mm system. Instead of dealing with 40,000 psi (pounds per square inch) chamber pressures, as is true with most rifles, or even 10,000 psi that most shotguns produce, we apply a relatively benign 2,600 psi when discharging an M79 or M203 round. At these chamber pressures, modest and easily available common steel parts work perfectly for constructing homemade firing devices.

By nature, the devices are relatively easy to make in one's home workshop. If this were not enough, the military has gone and redesigned the cartridges so that they are extremely easy to reload. Whereas 40mm rounds were originally designed using difficult-to-prime high- and low-pressure chambers, they are now set up so that all that is required to recharge the case is a .38 blank. It is best if these are reloaded at home, but even this requirement is not written in stone.

Reloadable 40mm plastic cases come as close to being universally available as any exotic large-bore in existence. It would be almost impossible, for instance, to find empty 25mm Peteaux brass, or 37mm, or virtually any of the other fun stuff, but empty 40mm cases are easily found for $.50 to $1 each. Numerous commercial manufacturers have even come on the scene, turning out new supplies for us to purchase.

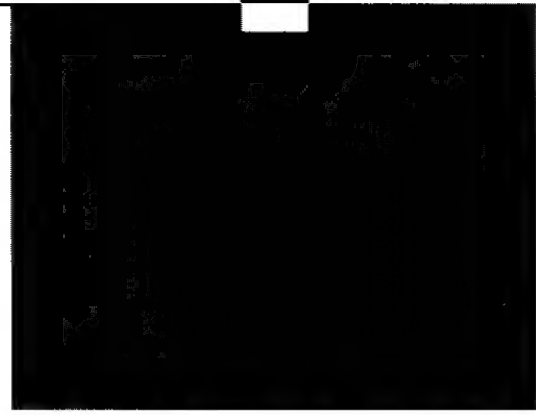
Sport shooting 40mm weapons is a happy

Two models of home-built 40mm weapons: M79 (left) and M203 (right) ready to be attached to a rifle.

combination of mortar, cannon, and high explosives. It takes a bit of skill to get on to them, but with practice, 40mm rounds are as accurate as light mortars within their firing distance. Grunts who practiced daily in Vietnam learned that they could put nine out of ten HE rounds through a hooch door.

A large number of loadings are available for the M79. One can use smoke, tear gas, shotgun, white phosphorus, and, of course, the intensely desirable HE rounds. Commercial manufacturers are even stepping up to the plate, offering new shot, smoke, and even white phosphorus rounds.

All of this adds up to interesting times for military big-bore enthusiasts. Although it is not the early 1960s again, makers are faced with the relatively easy task of constructing a firing device out of common materials, and ammo is common and relatively easy to reload. The information that follows provides in-depth analysis and guidelines for the home builder of the most entertaining and interesting big-bore military systems of all: the 40mm M79 and M203.



CHAPTER ONE

TECHNICAL DATA

When exploring the frontiers of new technology, one can never be too careful.

Methodically and carefully I wrapped the package of new nylon line around my home-built M79, binding it securely to the 12 x 12-inch support on my deck. The job would have proceeded a bit faster had I not been so cheap and unwilling to cut the new package of line.

After fastening the weapon to the support, I placed a piece of newly washed white cotton sheet over the breech. If something were to cut loose, I could—in theory—determine where and with what determination. Always with safety in mind, I donned a heavy horsehide jacket, heavy welding gloves, and a surplus German police riot helmet.

I crammed a factory-new military round into the breech of my home-built M79, then backed the barrel into the breechblock with a resounding thud. Even through my earmuffs, the detonating round sounded tublike and metallic, much like an 80mm mortar fired with full increments.

Observing the projectile was impossible till it got out about a hundred yards. Then it slowed and became very visible, arcing through the clear blue sky. But—horror of horrors—not everything was proceeding as planned: the projectile was traveling farther than I had supposed it might! My first inclination was to call NASA and ask them what to do, but before I could the projectile bounced to a landing and started spitting out hideous clouds of blue-gray smoke. The smoke wasn't a problem, but the resting place left something to be desired. We have but one neighbor within half a mile, and this round had selected his barn lot in which to return to earth.

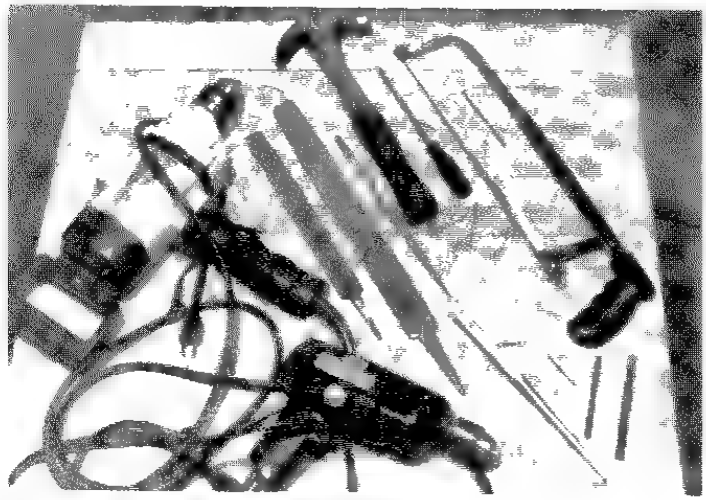
In spite of the fact that it took him less than thirty seconds to determine who was at fault and call me on the phone, I was hooked on 40mm weapons. It appeared that even wimpy smoke rounds were enough fun to get the neighborhood worked up. My neighbor's only request was that next time I fired off a round, I call him first so that he could come over to make sure I was careful.

Forty-millimeter grenade launchers, either of the M79 single-shot type or the M203 rifle-attached models, were, as I found out, not very difficult to build. My metalworking/welding skills are farm-boy class and nothing more. Grinding down some of the parts on a simple bench grinder and marking pins on a 1/2-inch drill was as close as I came to actually doing anything resembling machine work.

Building 40mm ammunition is a bit more complex, but to produce either or both of the weapons, the list of required tools is remarkably ordinary. Should the maker not have one or more of the major tools, they can either be purchased, rented, or substituted for relatively modest sums of money. Forty-millimeter home builders will find

that the job goes easier with small power tools, but they are not essential. A 1/2-inch electric drill, for instance, is convenient, but the job can still be done with a hand drill. True also with a saber saw vis-à-vis a common file.

The following is a list of tools that will be required along with brief descriptions as to their place in the process.



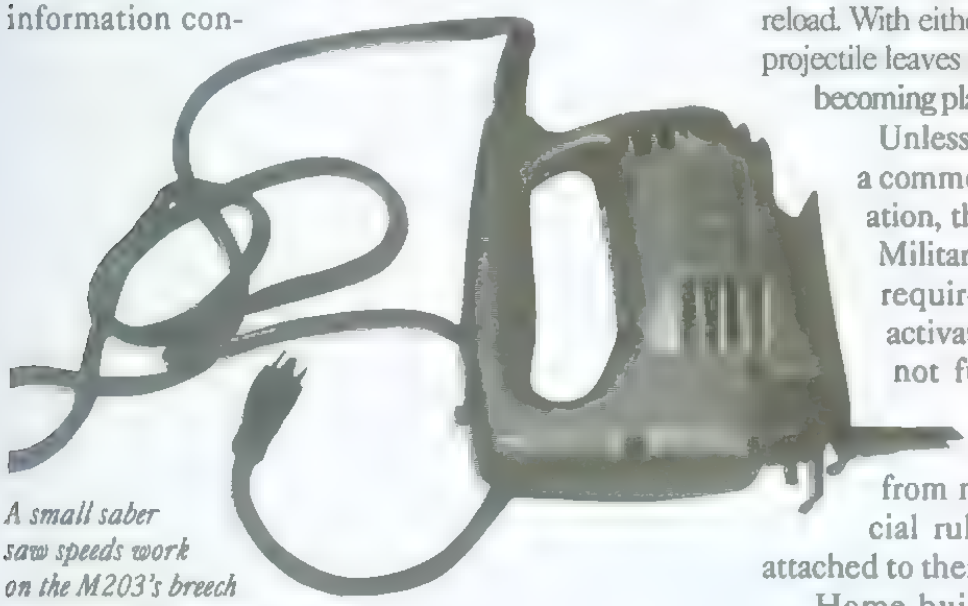
Most of the tools required to construct 40mm devices are extremely common and can be found in the average household.

1. A 1/4-inch electric drill with 13/64-inch drill bit used to bore out the set screw holes for the breechblock pieces.
2. A 5/16-inch drill bit used to construct the firing pin mechanism.
3. A 1/16-inch drill bit to bore out stop pin holes on the M203 firing pin mechanism.
4. A fine 4-inch flat file used to lathe down firing pins from common bolts for both models of grenade launcher.
5. A medium-grade 12-inch, 5/32-inch round file used to dress up notches on the M203 breech tube and clean out firing pin holes in the M203's firing mechanism.
6. A large production model 1/2-inch drill; chuck up bolts in this device and lathe them down with a file to make firing pins.
7. A 1/4 x 28 tap and turning wrench to cut threads for Allen screws used to secure the breech mechanism of both models. (Most builders will already own or wish to purchase an entire tap and die set, yet rather than spending $35 to $50, one could purchase the lone tap for less than $5.)
8. An electric welder and acetylene gas outfit. Although it might be possible to use only an acetylene welder, the builder thus equipped will probably want to have the arm of the M79 attached by a skilled technician in a shop with an electric welder. Two $20 bills would certainly buy all the welding on both an M79 and M203 from a professional, but the downside to this approach is that everyone will know what is coming together.

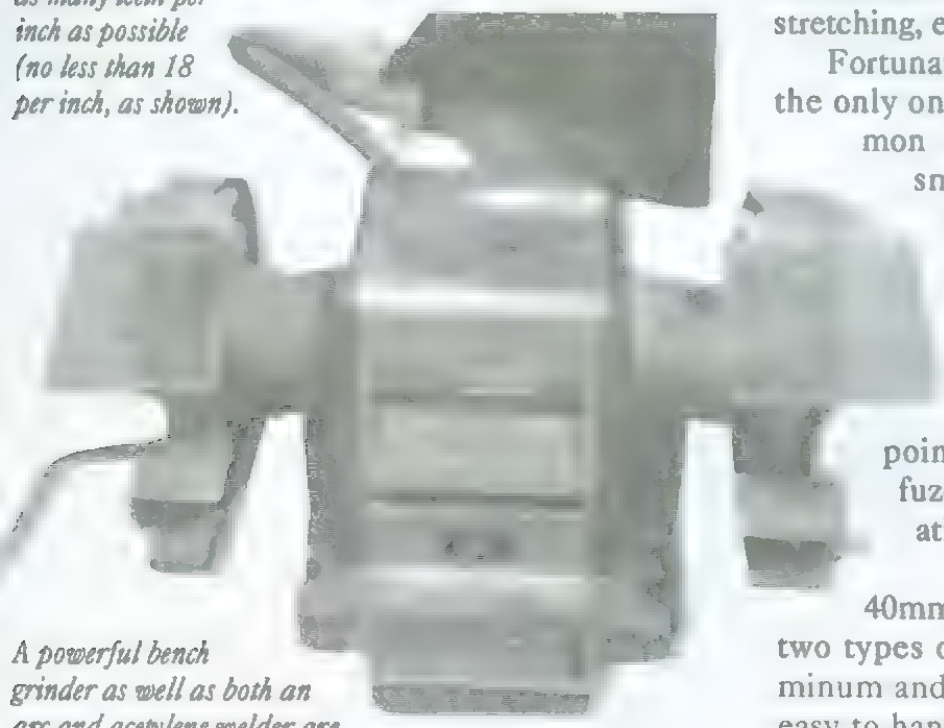
   The acetylene welder is used to construct the breechblocks and the M203 firing mechanism. An electric welder works best to fashion the breechblock to the M203 and M79 if it is permanently attached. An electric welder is virtually mandatory to fasten the pull arm on the M79 barrel.
9. A small electric saber saw with fine metal-cutting blade to cut the locking notches out of the breech piece on the M203. This job can be done with a file and hacksaw, but progress is, of course, much, much slower, requiring large helpings of elbow grease.
10. Even given a saber saw, 40mm builders will require a common hacksaw with high-quality 24-tooth blades to make notches in the M203 breech piece, cut bolts, and trim washers.
11. A common household hammer used to flatten steel and drive a punch to make drill holes.
12. A small metal punch used as drill hole marker.
13. A common 8-inch slot-blade screwdriver used to attach hose clamps and adjust the firing pin mechanism.
14. A bench grinder with medium to medium-fine stone used to surface the breechblock parts, dress up the barrels, and cut away welding slag from the various parts. (A file can be used but, again, will require additional patience and perseverance.)
15. A small Allen wrench of the correct size to operate a 1/4 x 28 Allen screw that holds the breechblock in place.
16. A powder scale used to load ammunition.
17. A .38 Special decapping and sizing die used to recap the many trial rounds needed to test the newly assembled grenade launcher.

Even an absolute tool klutz will agree that this is not an exotic or even difficult list with which to contend. Most of these items can be found lying around the average American home or are substitutable using a bit of money and/or energy.

Before starting on the actual construction of a 40mm grenade launcher and ammo, it is critical that the builder understand the theory behind the beast they are trying to create. Not all of the information contained in the government manual reprint on 40mms (page 7) is current. The data on high-pressure/low-pressure function, however, is still accurate, providing a solid launching point from which to construct one of these little marvels.



A small saber saw speeds work on the M203's breech locking slots. Purchase a steel-cutting blade with as many teeth per inch as possible (no less than 18 per inch, as shown).



A powerful bench grinder as well as both an arc and acetylene welder are required to complete this project.

About the only portion of this manual that has become truly obsolete relates to the ammo, which is now often loaded using nylon cases. The extruded nylon "brass" uses short .38 blanks and is ridiculously easy to reload. With either aluminum- or nylon-cased ammo, the projectile leaves the barrel at about 250 feet per second, becoming plainly visible after about 100 yards.

Unless the home builder chooses to adapt a commonly available M79 barrel to his creation, the fired round will not spin activate. Military rounds of the high-explosive type require a rifled barrel to spin them, thus activating the explosive charge. They will not function properly in a home-built 40mm device. M79 barrels are expensive, but they're available from numerous surplus dealers. No special rules or requirements are currently attached to their purchase or ownership.

Home-built 40mm devices are usually constructed using smooth-bore steel tubing. This common steel tubing shows no sign of abuse or stretching, even after repeated firings.

Fortunately, various types of HE rounds are the only ones that are spin armed. Other common military 40mm rounds—including smoke, buckshot, practice, parachute flare, CN gas, and others—are fuze activated. Thus they can be fired as issued from our homemade 40mm smooth bores.

All homemade ammo described in this book will either be point detonating (very dangerous) or fuzed HE rounds. Fuzed rounds are relatively safe but can be erratic at times.

While not specified in the manual, 40mm reloaders will commonly encounter two types of cases previously mentioned: aluminum and plastic. Plastic hulls are extremely easy to handle. Aluminum hulls are reloadable, but under much more adverse circumstances.

Information on reloading aluminum cases is included in Chapter 5, but one would hope that it is never necessary. As far as can be determined, the simpler nylon plastic cases can be used in virtually any circumstance with any load.

Some builders may be interested in the section in the manual that pertains to sights. My experience indicates that one will always use eyeball Kentucky windage with any home-built 40mm. Others may want to add sights, either from surplus parts or as part of the home building process.

I suggest a careful—30 minutes at most—reading of this field manual, paying especially close attention to the theory behind the function of 40mm weapons. This manual is out of print, so the information is not otherwise available.

FIELD MANUAL
No. 23-31

HEADQUARTERS
DEPARTMENT OF THE ARMY

40-MM GRENADE LAUNCHERS M203 and M79

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CHAPTER TWO

LEGAL CONSIDERATIONS

A bowling ball for a farm boy has about as much practical value as roller skates do for tree squirrels. When my brother unexpectedly brought one of the damn things home, we thought he might have lost his marbles. Everyone alive remembers where they were when Kennedy was shot. Momentous events are like that. I was putting my boots on in the wash kitchen when my brother walked in with the thing.

It was a used bowling ball, but in relatively nice condition as bowling balls go. Subsequent events indicate that we should perhaps have rated it as at least NRA "Very Good" condition.

The ball kicked (or rolled) around the farm while we tried to discover some productive purpose to put it to. During this time our Sunday afternoon large-bore recreational shoots reached virtually a fever pitch, yet my poor brother had neither mortar nor cannon with which to join in the festivities.

Whether it was brooding jealousy or just good native intellect, Brother finally hit on a plan by which he could also fire off some large-bore ordnance. One afternoon, he dragged his bowling ball, a post-hole digger, and a case of 40-percent dynamite down to the 40-acre playing field. Resolutely, Brother began digging a circular hole into the mucky, black Iowa soil. As I remember, it was coming on autumn and the first 2 or 3 inches of wet earth was fairly solid with frost. He finally managed to get a hole down 3 feet, into which he plunked a half-pound stick of dynamite. After lighting the fuze, he dropped the surplus bowling ball down the hole.

Dynamite at 2 1/2 feet in the ground makes only a slightly muffled thump upon detonation, but bowling ball and four wheelbarrows of dirt spit out down the range. Although he was aiming for our rope circle on the ground, the ball fell far short, propelling out a scant 60 or so yards in the general direction of the bull's-eye.

"Better angle the hole a bit more," Brother figured, "and not dig it so deep." He also reloaded with three sticks of dynamite in an attempt at better range.

This next shot was a trifle more effective, as the bowling ball had a better lateral component to it. Brother thought we would be jealous of his reusable projectile, but we controlled that emotion. By nightfall he had our cornfield pocked up like a Panamanian dictator's face. He used about half a case of dynamite and had halfway perfected the art of pitching the old bowling ball out across the countryside. We were happy that he had discovered some productive use for the thing, as well as keeping himself out of mischief. Unlike our cornfield, the ball seemed to be holding up well.

Even these many years later, questions still

run through my mind regarding this activity. Under the current law, should he have registered the bowling ball, the hole in the ground, the post-hole digger, or the dynamite? Obviously, devising laws covering DDs (destructive devices) is not easy.

In the event that you, the home builder of a 40mm weapon, wish to legally authenticate your little monster, be prepared for a long, difficult, convoluted, and often arduous journey. Theoretically, one can legally build and register an M79 or M203 in most states, but like many things in today's society, "the game may not be worth the candle."

In preparation for this chapter, I talked with several officers of the Bureau of Alcohol, Tobacco and Firearms (BATF), all of whom gave me slightly different answers to my many questions regarding licensing. It quickly became obvious that these people wanted, with all their bureaucratic hearts and souls, to tell me what could not be done as opposed to what could be undertaken while complying with existing laws. In many cases they genuinely did not know how to interpret my questions.

I was told by one agent that I could legally build and license a drop-fired 80mm mortar as long as it used black powder. Another agent explained that HE warheads were okay but could contain no more than a quarter-pound of explosives. A third told me categorically that I could own no weapon larger than half inch, and that was that.

When I asked about 12-gauge shotguns, which are about .78 inch, the agent talked about other issues until finally suggesting that I had best talk to the head office in Washington, D.C. I asked for written permission to proceed on drop-fired mortars and HE warheads as outlined by the first two agents but failed as of this writing to receive a reply.

Not only do various regional BATF agents hold their cards close to the vest and tend to pass out information out of step with national headquarters, they seem also to operate somewhat in the blind as a result of a lack of a fully formulated policy. Many people in the DD business feel the BATF is proceeding on a case-by-case basis, providing for some serious ambiguity.

Unlike ownership of full-automatic weapons, the demand for DD licensing apparently has not yet reached a sufficient level to push the BATF into a uniform posture pertaining to their regulations. Like the previous conclusion, this one is based only on supposition, but really seems to be in accord with what is happening out in the field.

Perhaps driven by the recent resurgence of interest in destructive devices, the situation may change. Necessary rules and regulations will probably be promulgated and will likely be more stringent than those currently in use. As a result, what you learn here may be obsolete by the time you are ready to make your petition to the BATF. My advice is to take the applicable bits and pieces I have garnered from the DD industry and government sources and weave them into a plausible, reasonable plan of action that's workable in your region. As in all matters of this sort, I recommend extreme caution.

The first and most important bit of research involves determining how the authorities in your state view destructive devices. In many cases, state laws are so convoluted and contradictory that they are virtually hopeless. Because these statutes often contain numerous loopholes, one could validly assume that some way to own DDs could be found by every determined builder in virtually any state. Yet most gun nuts do not have the money and patience to duke it out with the state attorney general's office over DD permits.

An in-depth analysis of the firearms and explosives laws of all fifty states indicates that many states have not even considered the legal problems related to the private ownership of DDs. Others completely and specifically outlaw them, while most are somewhere in between.

California is an example of a state that specifically prohibits destructive devices in its statutes. Montana, New Jersey, and Ohio are others among this special class of specific prohibitors. Ohio refers to these weapons as "dangerous ordnance."

Rhode Island and Washington state appear to flatly prohibit machine guns but not DDs! That would, if it is a correct reading on my part, be an

interesting switch for gun owners who could not legally possess an MG34 but could own an M79 or M203. This, however, may prove to be an oversight that the governor would quickly call the legislature into special session to correct, should you make serious inquiry regarding legality.

North Carolina's statutes refer to "weapons of mass destruction," pointing out that private ownership within the state is absolutely verboten. Massachusetts refers to DDs as "infernal machines" and, of course, punitively prohibits them all.

In both Oregon and Pennsylvania, a few cities specifically prohibit DDs. In this case, one would have to inquire locally. A few states specifically mention federal licensing, permitting ownership under circumstances where federal permits are held.

In spite of these seemingly specific prohibitions and, in a few cases, permission, statutes on the state level are never as clearly defined as one would wish them to be. Almost every state, for instance, prohibits the private ownership of bombs and exploding devices. Without making specific inquiry, it is impossible to determine if these prohibitions extend to 40mm rounds, even if one used only nonexplosive ammo with one's weapons.

Another problem is that most states specifically prohibit weapons with barrels shorter than 16 inches, which presents a whole new set of conflicts that the builder of a 40mm weapon must contend with. Home-built 40mm devices can be banged out with virtually any barrel length the maker desires, but generally he will probably want to produce models having something approximating the original specs, which are 12 to 14 inches.

Barrel length and explosive rounds alone produce a suspect situation in virtually every state in the Union. Calling the state attorney general's office in one's state capitol is perhaps the only way to determine the legal status of DDs. Even then, the advice given by the attorney general or his deputy will be subject to his knowledge of and prejudices for or against DDs.

The serious inquirer will almost certainly be required to submit his questions in writing. Being on the careful side would suggest that this be undertaken by one's attorney—another expense to add to the mounting collection gathered in pursuit of one's hobby. It may even be necessary to ask a local prosecuting attorney, sheriff, or police chief to send a letter of inquiry over his signature. This will not guard your anonymity but will produce a swifter response. In most larger states, the attorney general will not respond to questions from mere citizens.

As previously mentioned, the situation is only slightly better at the national level. The suggestions that follow are generally accepted practice in places where DDs are becoming popular, but may—depending on one's local situation—end up only being a starting point.

When I was given the contradictory advice from the BATF, which I knew was not the custom of the trade, I quizzed the agents further about their interpretation of the law.

"What specific definitions are you using?" I asked. "A 12-gauge shotgun projectile could conceivably be a destructive device under your definition."

"We really don't know," one agent finally admitted. "If you want exact information, you will have to call or write our main office in Atlanta, Georgia."

The address they suggested contacting is the Bureau of Alcohol, Tobacco and Firearms, Firearms Licensing Center, Box 2994, Atlanta, GA 30301. As of this writing, their phone number is (404) 986-6040. Another agent suggested Washington, D.C., but couldn't find the phone number or address while I was on the phone with him. According to my BATF manual, it is the Bureau of Alcohol, Tobacco and Firearms, Firearms and Explosives Operations Branch, Box 189, Washington, D.C. 20044. These people have phones, but getting through the switchboard to the appropriate person is virtually impossible. Their number is (202) 566-7777, for the brave. Their street address is 1200 Pennsylvania Avenue, Washington, D.C., for the terminally brave.

The general consensus out in the hustings is that the BATF is giving the public a pretty fair shake regarding DDs. Private ownership of these

weapons has not become widespread and therefore is not a major consideration for the average BATF agent. In other words, BATF is not used to dealing with DDs and is not yet afraid of them.

Also, builders/owners of DDs should be aware that they are not the same type of legal animal as full-auto weapons. Newcomers tend to lump the two together which, when done, presents a distorted legal situation. It is not, for instance, illegal to own just a DD receiver so long as the barrel is not attached. If the owner can otherwise own the receiver within his state of residence, Uncle Sam will not be a problem. Should the same owner be found in possession of both an unregistered barrel and receiver, this would be construed as illegal ownership of a DD—quite different from a full-auto weapon, where ownership of that weapon's receiver is an absolute no-no.

Oddly enough, the receiver of an M203 or M79 alone is subject to BATF Form 4473 used for transfer of over-the-counter weapons. This is the one we fill out at our local gunshop when purchasing a rifle or shotgun. Unlike a machine gun, an intact receiver from a DD is not the weapon itself. Perhaps this policy has more wisdom than rancor. How, for instance, would one define a receiver for an 80mm mortar or World War II bazooka?

Regular-operating licensed DD dealers are also manufacturers. A dealer is construed to be a person who both puts the devices together for resale and buys from other dealers and manufacturers for resale to the general public. A federal DD dealer's license costs $1,000 per year on a three-year basis. Dealers must shell out $3,000 every three years or lose their ability to buy, sell, and assemble DDs.

Dealers in DDs apparently cannot import these weapons from other countries for sale to the general public. This is unfortunate, since some very nice, inexpensive 40mm weapons are currently made in Turkey and Thailand as well as other places.

Interstate sales are preferably handled by transfer from one DD dealer to another in the buyer's resident state. Many, if not most, states do not currently have a resident DD dealer. As a result, a selling dealer in Florida or Texas may ask for a significant down payment. On receiving this, he will ship the barrel of the 40mm device to the buyer along with BATF Form 1.

BATF Form 1 is similar in design and content to the federal form used to transfer Class III full-auto weapons. Purchasers must have their fingerprints taken by the local gendarmes as well as being signed off on their character. On completion, the document is sent off to BATF headquarters for approval. A $200 transfer tax fee must also be included with the permit application. Normally, approval or disapproval takes three to four months. If the permit is approved, it comes back signed by a BATF director and has an accompanying tax stamp. A new owner validates the permit by attaching the stamp and signing across its face.

Before completing either the barrel or receiver portion of a 40mm DD, the legally circumspect home builder will want to complete a copy of BATF Form 1 and send it in with the $200 for approval. When the form returns, the builder can complete his weapon or, in the case of a straight purchase, send a certified copy to the selling dealer, who will then ship the missing half (barrel or receiver). It is my understanding that a builder can legally assemble a DD by simply registering it and paying the $200 tax—something that is no longer possible with full-auto weapons.

Questions arise over such weapons as 37mm barricade guns, 25mm flare pistols, and even 8-, 10-, and 12-gauge shotguns. All of these have larger bores than the magical half-inch limit. Eight-gauge shotguns have bores measuring .93 inches. Even much smaller 20-gauge guns have bores measuring .615, or .115 inches over the legal limit.

Although the code specifies that a destructive device is a weapon having a bore of half an inch or more, the folks at BATF have taken a rather intelligent and charitable approach to their enforcement activities. Apparently BATF does not want to break its pick by fighting with members of the scattergun fraternity. In this case, it appears to genuinely want to control

weapons that really are destructive devices. For starters, BATF has not concerned itself with fuze-detonated black-powder weapons of any type. Unlicensed private individuals can legally own and operate black-powder cannons and mortars so long as these weapons are not drop fired and have nonstandard bores vis-à-vis military weapons.

Owners are not harassed by BATF over barricade guns and flare pistols because no commercial high-explosive rounds have ever been manufactured for these weapons. This enforcement practice may soon grow a bit thin with the increasing popularity of explosive 12-gauge rounds. Given the universality of 12-gauge guns, any enforcement will no doubt be directed toward the ammunition rather than the weapons. This will probably occur just as soon as some nut tries to blow up a McDonald's in California with 12-gauge explosive rounds.

Sincere BATF sanctions fall on high-explosive rounds. At least one DD dealer claims he can and will supply factory-made HE 40mm rounds. The purchaser must pay a $200-per-round transfer tax plus the appropriate Department of Transportation freight rates, and provide for appropriate explosives storage on delivery. Obviously this is far too expensive for all but the super rich, even discounting problems dealing with the local authorities.

No one in the active DD community can think of an individual who has tested this system and legally taken delivery of live HE rounds. It is rumored that HE rounds sometimes surface near military bases and are subsequently tested by owners of 40mms (though as mentioned earlier, these rounds will not function properly in a home-built smooth-bore weapon as described in the following chapters).

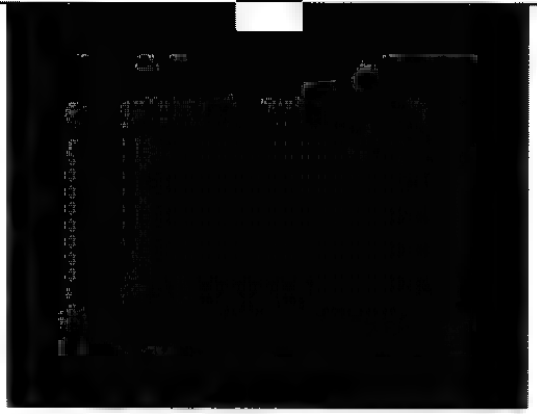
Inserts designed to convert one's M79 or M203 to a single-shot 12-gauge device are turning up on the private market with increasing frequency. According to federal authorities, if the device is permanently affixed to the 40mm weapon, the owner has a shotgun, not a destructive device. The owner does, however, have a short-barreled shotgun, which is, of course, subject to other federal restrictions.

Other nonexplosive 40mm rounds, such as shot, flare, smoke, practice, parachute, gas, and even white phosphorus, are not subject to BATF restrictions. This, again, assumes that one's regional office and state officials comply with generally accepted practice.

Obviously the best course of action for the potential DD builder/owner is to first contact his state authorities and then the feds. You may get a slightly different story than outlined here, but use this information to try to get your set of officials to adhere to the regular party line.

BATF officials are going to be extremely reluctant to put anything in writing for you, the potential new owner of a destructive device. It may even be necessary to set out with nothing more than telephone approval, which is really not a very smart way to go. To their credit, BATF seems to be trying ever so cautiously to use common sense.

As always, let the builder beware. Common sense is the most uncommon of senses . . .



CHAPTER THREE

HOME CONSTRUCTION OF AN M79

Construction of a good, effective, reliable M79 in one's basement workshop is so simple that most people will require only this chapter's photographs to complete the job. Gun nuts no longer need furtively fantasize about fun-filled afternoons pooping out heavy grenades. My estimate is that hundreds if not thousands of fun-loving readers will construct their own M79, and not a single person will spend more than $50 for parts, nor invest more than a week's work (forty hours) assembling them.

There are three major components for which the builder must scrounge a bit. For some of these acquisitions, circumstances and luck play a minor role. All can be purchased if need be. The first, falling squarely in the category of "it's nice if you can scrounge this piece from your old parts bin," is a surplus rifle stock. The stock can be military, commercial, or even surplus in origin. Almost any precut rifle stock will work. Buy one if you must, but it is always nice to use that old stock you have had lying around for years. Forty millimeters are hard on stocks, so choose a stout military variety if possible.

After this the assembler will require a breech sleeve and barrel. The breechblock is made from some of the same material used in the barrel. Construction of the breechblock and firing pin, comprising the third component group, definitely constitutes the only part of this project requiring mechanical ability past the level of the average cocker spaniel.

Starting from the top, go to the nearest full-service steel warehouse, welding shop, machine shop, or well driller's supply house. You will need to purchase two pieces of steel pipe. The best, strongest pipe commonly available is DOM, which roughly translates into "drawn over mandrel" pipe. DOM pipe has no seam and

PARTS LIST FOR M79

- 16-inch length of 1 1/2-inch (inside diameter) standard-weight steel pipe
- 9-inch length of 2-inch (inside diameter) heavy-walled steel pipe
- 1 1/2-inch length of 1 1/2-inch steel pipe
- 2-inch long 3/4-inch bolt
- Three heavy duty hose clamps (approximately 4-inch)
- Twelve 1/4 x 28 Allen screws 3/4-inch long
- One 3/4-inch heavy flat washer having approximately 2-inch diameter
- Three 5/16-inch machine-thread nuts
- One 5/16-inch machine-thread bolt 3 inches long
- One surplus rifle stock

is generally considered to be tougher material than standard pipe, better able to withstand higher internal pressures. In some places in the United States, DOM pipe is not available; if that's the case in your area, use the best high-grade steel pipe available. In my area DOM pipe is not carried by machine shops. The steel pipe they do carry will reportedly withstand 10,000-psi pressures which, even without the heavy breech piece, is absolutely adequate for the intended purpose. Steel pipe required for this project is not of the type one is likely to find in plumbing shops.

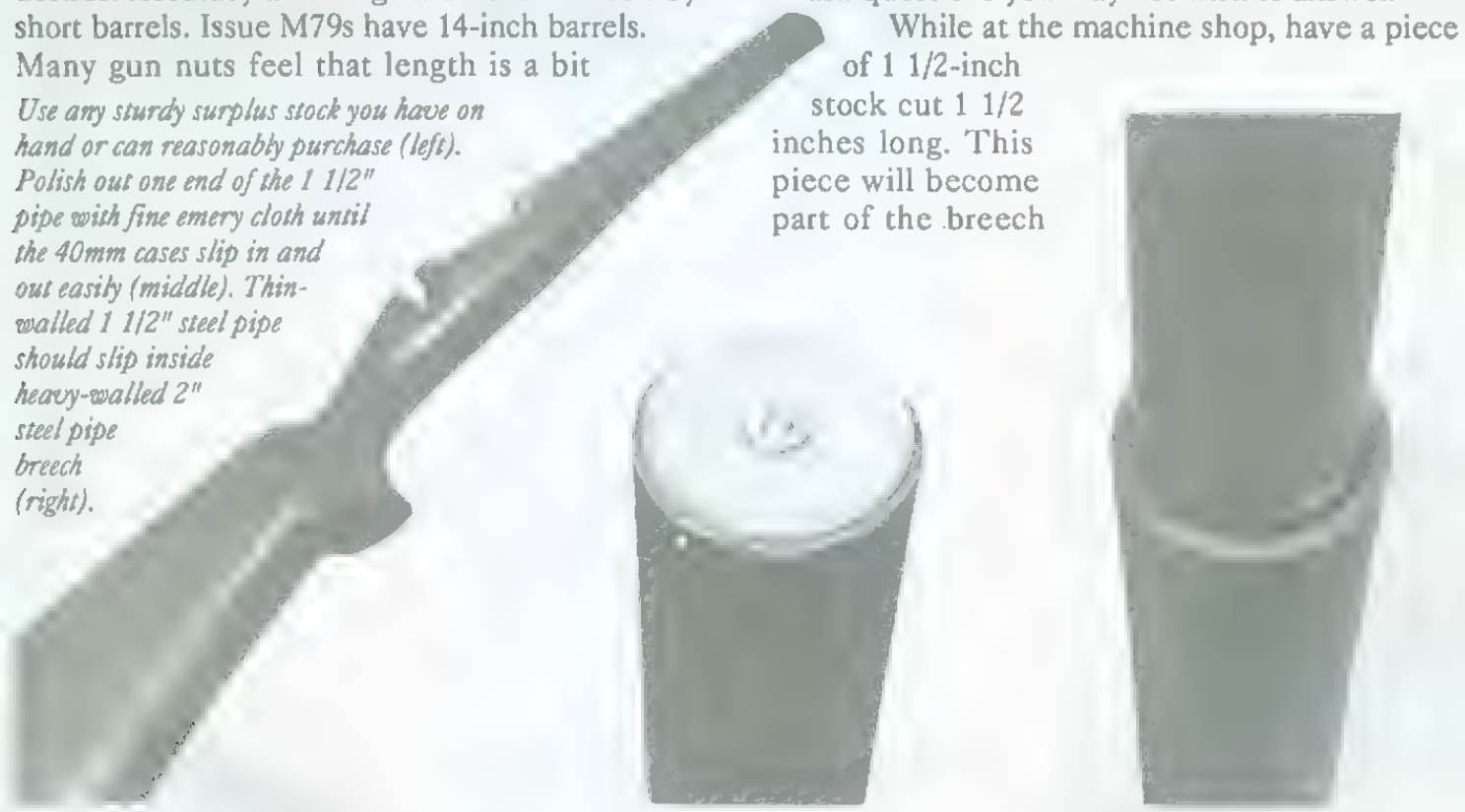
For the breech, purchase one 9-inch-long piece of 2-inch diameter heavy-walled steel pipe. Standard-walled 2-inch will not, in this case, work. Be sure to specify heavy-walled 2-inch pipe. Have the shop cut the pipe stock and then clean the newly cut ends with their reamer. By so doing they will smooth off the sharp edge and burrs in a much neater fashion than one can ever hope to accomplish at home. The extra dollar or so spent on this operation is money extremely well spent.

M79 barrels can be any length the builder desires. Accuracy and range are not sacrificed by short barrels. Issue M79s have 14-inch barrels. Many gun nuts feel that length is a bit short for the style of weapon they are building, opting instead for a barrel about 16 inches long.

Select a piece of standard-weight steel pipe with a 1 1/2-inch inside diameter. Check to see that it is the correct diameter by pushing an empty 40mm case into the pipe. The empty should fit sufficiently snug so that one must push fairly resolutely to get the case inserted all the way. Later you will polish out the bore of the weapon with fine emery cloth so that the rounds easily drop in. At this time all that is needed is an indication that the correct pipe is indeed in hand. By decapping the nylon case first, the machine shop attendant will almost certainly be unaware of the origin of your gauge, as 40mm cartridges do not really look like cartridges.

Test the two pipes by ensuring that the barrel piece (16 inches long, 1 1/2 inches in diameter) will closely slide inside the breech piece (9 inches long, 2-inch inside diameter). First-time M79 builders can be certain they are on the correct track for size and wall thickness by purchasing both the barrel and breech pipe at the same time. The only disadvantage to purchasing both items at the same shop is the fact that the clerk may ask questions you may not wish to answer.

While at the machine shop, have a piece of 1 1/2-inch stock cut 1 1/2 inches long. This piece will become part of the breech



Use any sturdy surplus stock you have on hand or can reasonably purchase (left). Polish out one end of the 1 1/2" pipe with fine emery cloth until the 40mm cases slip in and out easily (middle). Thin-walled 1 1/2" steel pipe should slip inside heavy-walled 2" steel pipe breech (right).

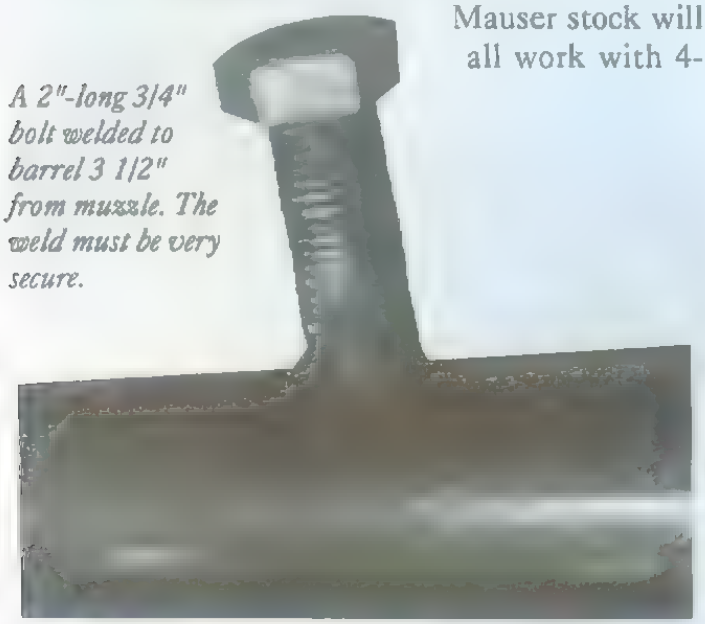
later on in the construction process. The short piece can only be reamed on one side since it is too short to lock into the power-cutting tool. This will not be a problem in the final assembly.

On the way home from the machine shop, stop at the largest, full-service hardware store in the area. Purchase one 3/4-inch bolt 2 inches long, three heavy-duty 4-inch hose clamps, a dozen 1/4 x 28 Allen screws 3/4-inch long, a 3/4-inch flat washer with a 2-inch overall diameter, three 5/16-inch machine-thread nuts, and one 3-inch-long bolt of the same thread.

Larger flat washers come with various-sized inside holes. The trick here is to find a heavy washer with a 2-inch outside diameter and as small an internal hole as possible. One hopes your hardware store will have one that will work. If not, try a farm and implement store. Tell the clerk what you need; he will almost certainly scrounge one up for you. Try to come up with a washer with an approximate 3/4-inch center opening.

A dozen Allen screws is probably too many for the task at hand, but they tend to break and get lost on the floor. Buying a dozen prevents emergency trips to the hardware store in the middle of the night.

The 4-inch hose clamps are used to secure the breech piece to the rifle stock. Depending on the stock finally scrounged, it may be necessary to use clamps from as small as 3 inches up to 5 inches. A surplus 03 Springfield, Enfield, or Mauser stock will all work with 4-inch hose clamps. Larger Enfields will require larger clamps. Stocks a bit long can be easily trimmed back to suit the builder's fancy.



A 2"-long 3/4" bolt welded to barrel 3 1/2" from muzzle. The weld must be very secure.

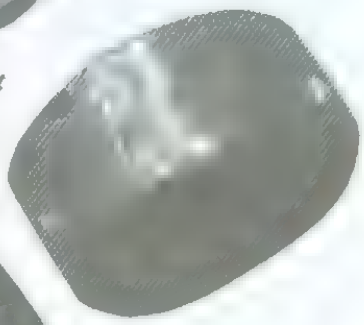
Polish down 3/4" washer on the bench grinder until it slides into the 2" breech piece.

Back in your shop, select the cleanest, most open end of the 1 1/2-inch barrel pipe for the chamber and polish it out. Securely weld the 3/4-inch bolt to the other end of the barrel 3 1/2 inches from the muzzle. Take particular caution to stand the bolt out perpendicular to the barrel, and to weld it securely all the way 'round. (A friend inadvertently welded the bolt to the breech end, necessitating another two hours of polishing the chamber.)

Customarily, 2-inch washers are very thick. Should the ones found in your area be under 1/4 inch in thickness, however, it will be necessary to weld two together to provide the necessary heft. Factory-new 2-inch washers will not easily slip into the weapon's 2-inch breech piece. Using a common bench grinder with medium stone, grind down the washer round and round till it easily and evenly slips down into the breech. This work can be accomplished by holding the washer with thick leather gloves, allowing it to rotate as it is dressed down by the grinding wheel. Test it in the breech often as the work proceeds so that as smooth a fit as possible is maintained.

On completion of the washer fitting, lay it on a heavy iron anvil or large vise. Place a 5/16-inch machine-thread nut in the center hole, being sure

A 3/4" steel washer with 5/16" nut brazed in center. Finished firing pin and lock nuts also shown (above). Side view of the breech washer welded to 1 1/2" pipe piece. Note two craters that act as seats for Allen screws (right). Close-up of locking Allen screw, one of three used on breech tube of the M79 (below).



sure it is flat on the down side.

Very carefully braze the nut into the center of the washer. Be especially careful to protect the nut's threads and to maintain its center alignment. This nut will eventually retain the firing pin, providing an important opportunity to adjust the pin in and out.

Lay the small 1 1/2-inch-long ring of 1 1/2-inch pipe on the washer carefully and braze the two together evenly. The center hole of the washer must lay exactly in the center of the ring. Braze them all into one solid mass, again paying close attention to preserving the nut's threads in the center of the washer.

Using a 13/64 drill, drill three opposing holes through the breech piece 3/4 inch from the rear of the piece. Tap them with your 1/4 x 28 tap.

Cut the head from a 5/16" machine bolt. Use the shaft portion to turn a firing pin.

Try the new holes with the Allen screws, but do not set the screws permanently in place.

Slide the washer, with nut and 1 1/2-inch ring attached, into the breech pipe and tighten down the three Allen screws to mark the breechblock ring inside. Withdraw the ring and drill shallow craters at the places it is marked. Replace the ring again, this time tightening the Allen screws and securing it solidly into the main breech piece. Torque down the Allen screws as securely as possible. Some might break during this procedure, but they can be replaced easily.

Any machining required during the course of this project is included in the next step: making an adjustable firing pin.

Thread the 5/16-inch bolt down to its head, assuming it was not possible to purchase a prethreaded bolt of the correct size. Using a hacksaw, cut the head from the bolt and carefully grind the cut end flat.

Now, carefully wrap tape around the end of the bolt to protect the threads. Chuck the bolt, tape end first, into a 1/2-inch drill. This drill is about to become your lathe to turn the bolt into a firing pin. Clamp the drill into a vise or tie it securely to a tabletop.

Turn the drill on, rotating the bolt shaft. Using a 4-inch fine flat file, work the bolt down to a fine pin diameter of about 1/16 inch. Cut the pin back only 3/8 inch from the end of the bolt.

When the pin is the correct diameter, put a sharply beveled point on it.

Take the pin out of the drill, remove the tape, and cut a shallow screwdriver slot with a hacksaw on the opposite end. This entire operation may take thirty minutes or more, assuming it is done correctly the first time, but on completion the firing pin is ready to be screwed into the breechblock piece. Set it in the block so that it barely protrudes through the washer and nut. Set it too long and it will tend to bend or break. Set it short and it will fail to detonate the round.

Some trial and error is required at this point. Punch the propellant cartridges out of several 40mm empties, then recap and reset them in the 40mm cases. (Complete data on cartridge loading is included in Chapter 5.) Use these primed cases to test the action of your new M79.

Wrap tape around bolt threads and chuck into fastened-down 1/2" drill. Work the end down to 1/16" for the firing pin.

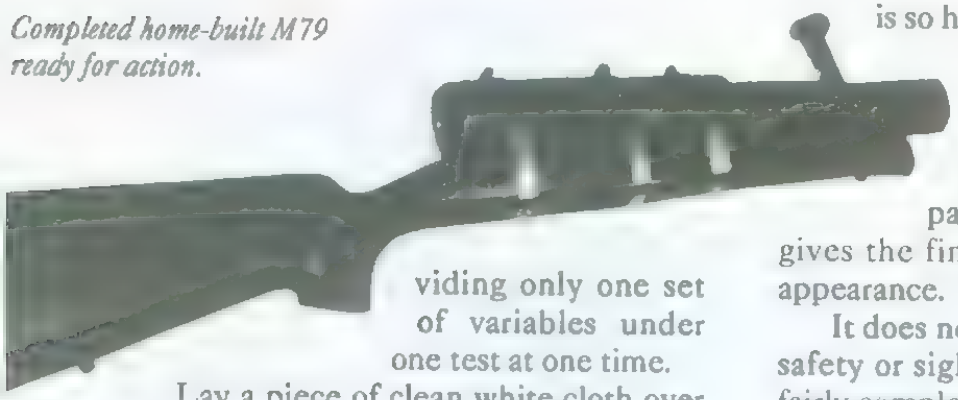
Face of firing pin assembly with firing pin protruding through washer.

If you have not already done so, secure the breech piece, now with firing pin installed, to the rifle stock using three hose clamps. Although the recoil from the weapon is more of a gentle nudge than a sharp kick, there is still enough there to back the round, smooth breech piece through two clamps. Three are recommended.

Since this is a fairly powerful and potent firearm, I recommend test firing at least two military rounds through the newly made weapon from a tied-down position. Use military ammo rather than reloads, pro-

Completed firing pin assembly installed in breech pipe. Note screwdriver slot and secure braze holding assembly to pipe.

Clamp the completed breech to the rifle stock. Test the firing pin using primed cases; test completed M79 with military surplus rounds.



Completed home-built M79 ready for action.

viding only one set of variables under one test at one time.

Lay a piece of clean white cloth over the breech and then a piece of heavy canvas over that. Load up the barrel. Using the 3/4-inch bolt as a handle, slam the loaded barrel lock into the breech to discharge the weapon. By this time, the maker should be familiar with the firing action as a result of the trial-and-error setting of the firing pin when using primed cases.

The weapon generates little noise on discharge. In that regard the newly built M79 can be test-fired in fairly populated areas. However, the range is greater than one might normally expect. Caution is advised lest you too drop a smoke round on the neighbor's porch.

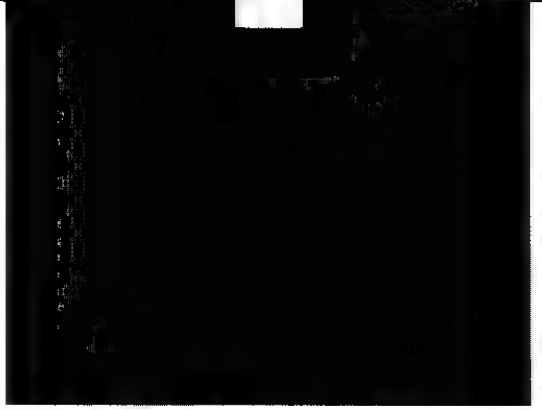
Assuming one has taken the time to adjust the firing pin correctly and has torqued in the breech piece securely, there should be no problems. This is a low-pressure weapon, especially suited to home manufacture. The weapon is ideal in that it is so high-tech it has become low-tech.

At the conclusion of the testing, some owners may wish to chuck a wire brush into their grinders and burnish the metal parts. A thin coat of black spray paint gives the finished M79 an especially ferocious appearance.

It does not appear necessary to install either a safety or sights on home-built M79s. Sights are fairly complex to build or expensive to buy if one uses surplus parts, and they are not particularly effective anyway. Most people learn to do quite nicely using only estimation and Kentucky windage. Because it is easily possible to see the round in flight, it takes but ten or fifteen practice tries to become surprisingly proficient.

A good sharp tug on the barrel is required to fire the cartridge, so a mechanical safety is mostly superfluous. If a safety seems absolutely necessary, drill a 1/16-inch hole in the breech just ahead of the breechblock. Insert a piece of piano wire (purchased from a hobby shop) in the hole so that it lies between the round and the firing pin. When ready to fire, just pull the wire.

Remember, this is a big, powerful weapon. Do things carefully and properly. Even then, it is extremely easy to injure oneself in the process. Let the builder beware.



CHAPTER FOUR

HOME CONSTRUCTION OF AN M203

Constructing a good, workable M203 in your home workshop is not as simple as building an M79, but it is still possible for those who are only marginally mechanically inclined. The project will, like the M79, cost less than $50 for supplies, but the wise builder will budget a minimum of sixty hours of construction time.

Building a workable breech mechanism containing a functional firing pin requires quite a bit of welding. Some of this welding must be done with a fair degree of precision. In the end, the trigger is more Mickey Mouse than clever high-tech, but it has the distinction of being workable.

After my having issued those appropriate disclaimers, do not be dismayed or discouraged. A good, workable M203 can be yours if you persevere and are willing to possibly do several of the steps over again without becoming unduly discouraged.

First thing, head straight to your nearest, most user-friendly steel supplier or machine shop. Purchase one piece of heavy-walled 2-inch (inside diameter) DOM steel pipe or other high-grade seamless steel pipe stock for your breech. Have the shop cut it 4 inches in length. While there, also have the machine shop ream out the freshly cut ends, producing a nice, clean rim free of sharp lips or nicks.

The barrel piece is cut from 1 1/2-inch standard-weight DOM stock or other high-grade, seamless steel tubing of the same general type as the breech piece. Slide an empty 40mm cartridge into the tubing to be sure the diameter is correct. Slide the barrel piece through the breech piece as well, being certain that the fit is close.

Barrel length for an M203 is a matter of personal preference, with everything from 9 to 16 inches being workable. Lesser lengths are lighter and as accurate as

PARTS LIST FOR M203

- 4-inch length of 2-inch (inside diameter) heavy-walled steel pipe
- 12-inch length of 1 1/2-inch steel pipe
- 5/8-inch length of 1 1/2-inch steel pipe
- Four 3/4-inch heavy steel flat washers
- Seven 1/4-inch steel flat washers
- Round piece of tin, exact size of 40mm case
- One 5/16-inch machine bolt, 6 inches long
- Two 5/16-inch machine nuts
- One 5/8 x 4-inch compression spring
- One 3/8 x 3-inch compression spring
- Piano wire
- One 1 x 1 1/2 x 4-inch wood mounting block
- Three heavy-duty 4-inch steel hose clamps

longer, arguing for a 10- or 12-inch model. As with the breech piece, ask the machine shop to thoroughly ream out the ends, removing burrs and overhang left over from the cutting process.

At this time, also have the shop cut a 5/8-inch piece of 1 1/2-inch stock to be used later as a breechblock retainer. Because of the short length, only one side of the piece can be reamed. This should constitute no problem during final assembly.

In your shop at home, use a piece of fine emery cloth to polish out one end of the barrel so that the 40mm rounds drop easily into the chamber.

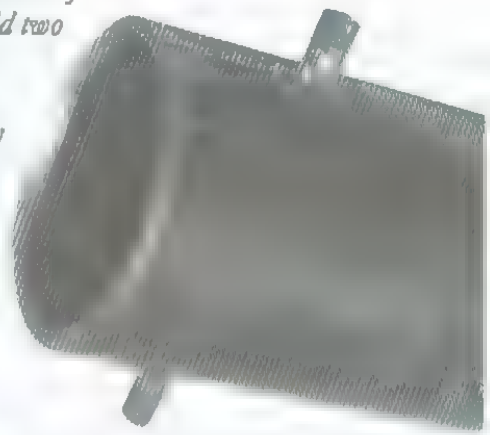
Measure in one inch from the polished chamber end of the barrel and punch a mark on the outside. Exactly 180 degrees around the other side, mark and punch again. Using the solid shaft portion (not the threaded end) of a 1/4-inch machine bolt as stock, weld two 3/4-inch studs securely onto the barrel at the locations marked. This operation must be done with an arc welder, and it must be accomplished so that the two studs stand out absolutely straight and are as solid as electric welding can make them. These studs must also be on exact opposite sides of the barrel.

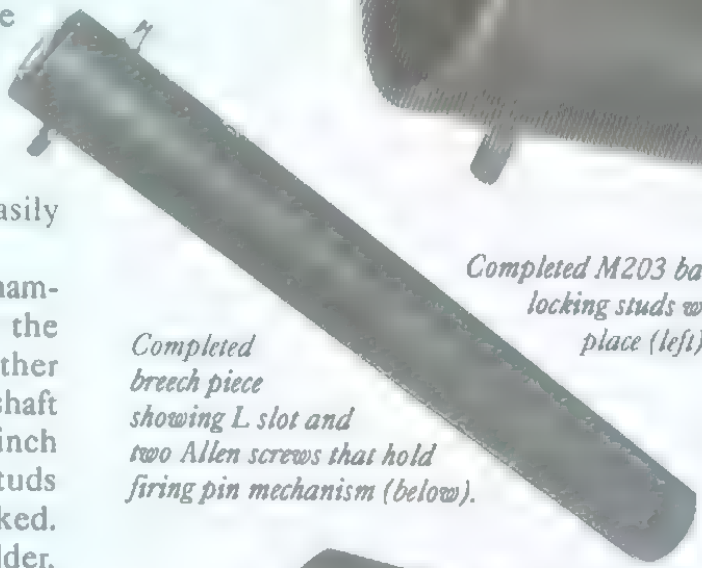
Using a large flat file, trim off the excess weld from around the studs. These studs will eventually secure the barrel to the breech by sliding into slots cut in the breech piece. Look ahead in this chapter to determine which surfaces should be smoothed down with the file. Obviously if all are taken completely off, the studs will retain little strength.

Slide the barrel piece, stud end first, into the breech piece until movement is stopped by the two studs. Mark the spot on the breech piece rim where the two studs hit. Using either a hacksaw, file, or saber saw equipped with metal blade, cut two slots down into the breech piece. Keep the slots as narrow and straight as possible while still allowing space for the studs to pass through.

When the in-and-out slot is from 3/4- to 1-inch deep, cut two slots at right angles paralleling the end of the breech piece. These L slots allow the user to turn the breech piece around the barrel studs, locking the two pieces together. Cut

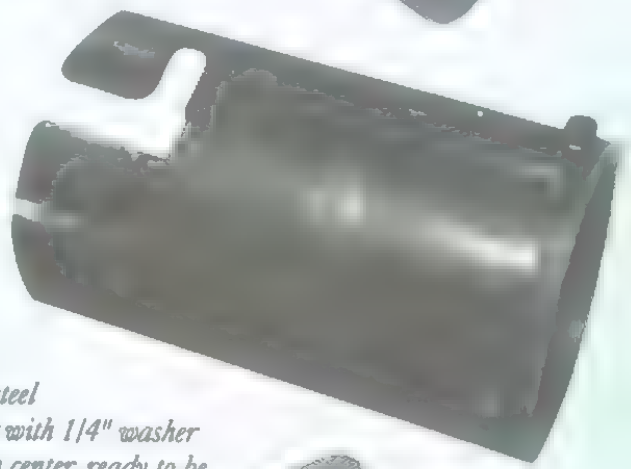
Polish out the chamber of the M203 and weld two studs 1" from the breech end. These welds must be very solid and not sloppy (right).



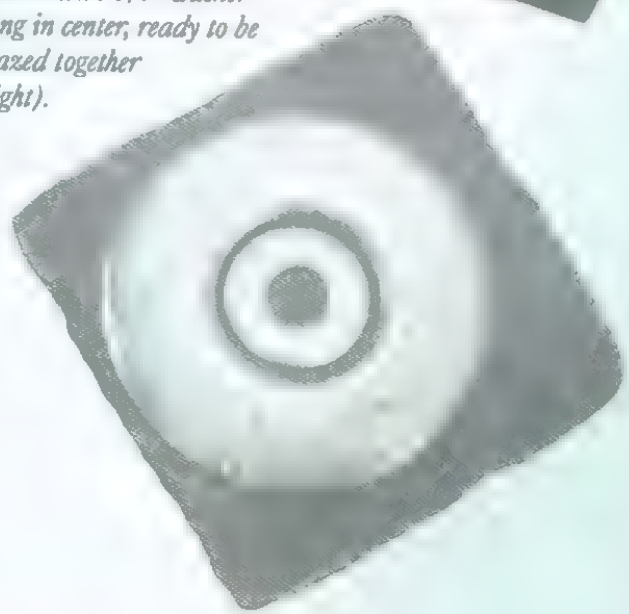


Completed M203 barrel with locking studs welded in place (left).

Completed breech piece showing L slot and two Allen screws that hold firing pin mechanism (below).



A 3/4" heavy steel washer with 1/4" washer lying in center, ready to be brazed together (right).



both right-angle slots simultaneously at least 3/4-inch long, testing the fit often. The job is successfully completed when the breech piece will turn and lock.

It is helpful to use a small rattail file or chainsaw file to cut two small circular chambers at the end of the L slots so the studs can slip into these positions and hold the assembly together.

The easy portion of assembling an M203 is now behind the builder. What comes next is often frustrating and difficult for the mechanically disinclined.

Purchase four heavy-bodied 3/4-inch (hole) washers having approximately a 2-inch diameter. These are always available in farm supply stores and usually available from full-service hardware stores. Polish down all four washers very slightly so that they will just slide into the 2-inch breech piece. This is best done by rotating them gently on a rapidly turning stone of a bench grinder. Wear heavy leather gloves or else other more expensive parts besides the washer may be ground down.

Heavy 3/4-inch washers of an approximate diameter of 2 inches will just about contain a regular 1/4-inch flat washer in the center hole. The fit is actually a bit sloppy, and the 1/4-inch flat washer is much thinner than the 3/4-incher, so eventually two will be used.

Carefully place the 1/4-inch washer flat inside the turned down 3/4-inch washer, laying both on an anvil, steel vise, or other flat massive steel surface. Center the hole in the 1/4-inch washer exactly inside the larger, cut-down 2-incher. Being ever so exacting, using a small flame to keep movement down, braze the smaller washer to the larger. After that washer is secure, place a second in the hole exactly over the first and braze it fast. These two washers together provide sufficient heft to match the outside washer when brazed solid all around.

Brazing tends to warp the pieces out of alignment a bit. Take great care that the hole in the finished product is centered and that the brazed package is absolutely flush flat on one side. If it is not flush and flat, it may be possible to grind or file the lumps out. If the hole is not centered, throw the washer away and start over.

Place an empty, unprimed 40mm round in the barrel piece. Lock the barrel onto the breech piece via the L slots previously completed. Drop the washer in on the barrel through the back of the breech piece. It should be possible to see the exact center of the 40mm case through the 1/4-inch hole in the washer. Take this washer back out for now.

Cut an old piece of tin can, tin sheet, or copper to the exact circular dimension of the 40mm round. Drop the circular metal piece down onto the empty 40mm case, and place the washer back inside the breech tube over the top of the tin circle. Be sure the package is tightly packed together and that both tin and washer bear down flat against the 40mm case. Punching a neat, clear hole in the center of the tin spacer helps immensely to keep all the centers lined up.

Using either a gas or electric welder, weld the washer in place inside the breech tube. Weld it completely around, as opposed to tacking in three or four places. Theoretically, the tin piece will prevent the weld from heating up the empty case while it does its job of providing the correct space in the breech.

After welding, the tin piece is discarded. Weld only the rear of the breech washer. Even a very smooth, professional weld on the front (cartridge) side of the washer will destroy the headspacing of the barrel (if one can use this term under these circumstances).

By grinding and brazing, prepare a second 2-inch washer like the one already welded fast inside the breech piece. Drop it in on top of the first washer. The two 1/4-inch holes should align absolutely perfect with each other and the primer in the cartridge below. A metal rim left from welding the first breech washer in place should hold the second, most rearward washer off the face of the first about 1/4 to 3/8 of an inch, providing free travel space for the firing pin. A sloppy job of welding in the first breech washer will quickly put the kibosh on the project at this point.

Doing everything by eyeball measure provides numerous opportunities for inaccuracies, especially for those with no aptitude as machin-

ists. Fortunately, the steel breech piece and washers used so far are very inexpensive. Little except time is lost by going back and starting over.

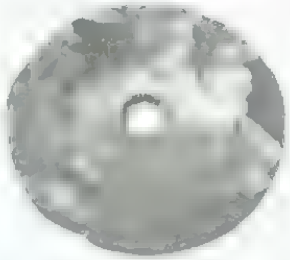
Assuming all looks proper, slide the small 5/8 x 1 1/2-inch piece of steel pipe into the breech. This is used to keep the second backing washer in place. Drill a single 13/64-inch hole into the breech piece and tap it with a 1/4 x 28 tap. Secure the steel ring in the breech with an Allen screw set in as tightly as possible.

Construction and final assembly of the firing pin constitutes the last major hurdle facing the M203 builder. Start the pin construction process by cutting the head from a 6-inch-long 5/16-inch machine bolt. Save the threads on the opposite end for later.

Wrap a piece of heavy tape around the threads and chuck the steel shaft, threaded end first, into a 1/2-inch drill. Using a 4-inch file, cut a fine tip on the bolt approximately 1/16 inch in diameter and 3/8 inch long. Three-eighths is too long for the firing pin tip, but is about as short as one can cut it using semiprimitive home workshop tools. At the end of the process, slope the shaft leading up to the firing pin so that it will slip easily through the washer assembly. Trim the firing pin tip back till it's about 1/4 inch long. If you did not shorten the tip, the firing pin will bend and break after only a very few rounds.

Drop the turned-down firing pin through the two breech washers, allowing it to protrude out the cartridge side of the breechblock assembly about 1/4 inch, including the shortened pin itself. Mark the pin shaft at the spot immediately above the second rearmost washer set inside the breech tube. This is a very critical and sensitive measurement—one that, if done incorrectly, may lead to the turning down of a second firing pin.

Drill a 1/16-inch hole through the firing pin at the mark. This hole marks the farthest point forward that the firing pin can travel. Push a cotter pin through the hole and place a 5/16-inch washer on the steel shaft behind the cotter key. Place a 5/8 x 4-inch compression spring down on the washer. Quite a bit of force must be exerted on the firing pin by this spring. It may be necessary to include a second, smaller and shorter compres-

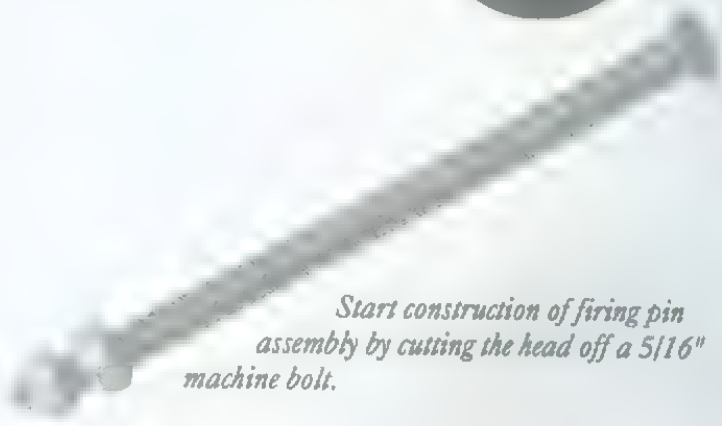


A 1/4" steel washer brazed inside a 3/4" steel washer, forming a solid unit. One side must be perfectly flat, as this completed washer shows.

Tin spacer that will temporarily be placed over an empty round in the M203 barrel.

Place completed washer in breech piece (locked to barrel), with tin spacer seperating washer and a round in the chamber. Weld washer fast to breech piece, maintaining headspace established by the empty round and tin spacer.

The 1 1/2" steel pipe piece dropped in breech as spacer, with firing pin washer dropped in on top of welded washer-spacer and second washer.

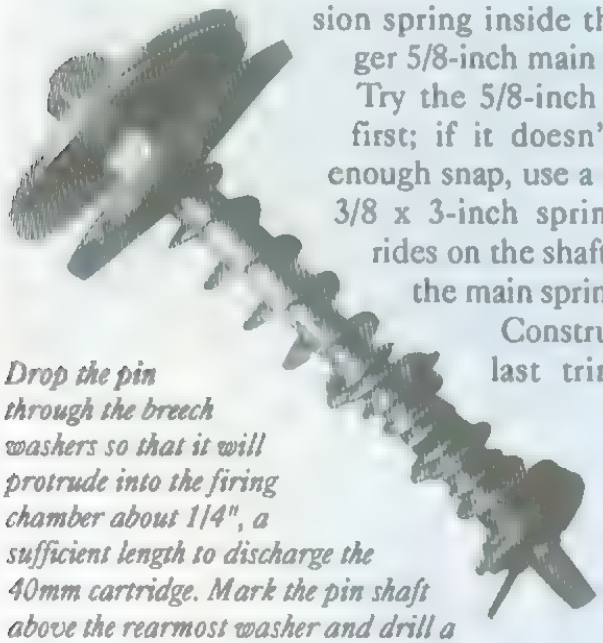


Start construction of firing pin assembly by cutting the head off a 5/16" machine bolt.

Chuck the bolt in a 1/2" drill. Work the tip down to a 1/16" x 3/8" firing pin. Shorten the pin to 1/4" so that it will not bend or break.

Lock rear retainer washer into breechblock assembly.

Add several heavy washers and nuts to firing pin to give it weight.



Drop the pin through the breech washers so that it will protrude into the firing chamber about 1/4", a sufficient length to discharge the 40mm cartridge. Mark the pin shaft above the rearmost washer and drill a 1/16" hole at this spot. Place a cotter pin through the hole.

sion spring inside the bigger 5/8-inch main spring. Try the 5/8-inch spring first; if it doesn't have enough snap, use a second 3/8 x 3-inch spring that rides on the shaft under the main spring.

Construct one last trimmed-down 2-inch washer with two 1/4-inch flat washers brazed in its center. This washer becomes the rear spring retainer on the breechblock firing mechanism. Drill and tap two or three holes for 1/4-inch Allen screws at the rear lip of the breech piece. Cinch these Allen screws down onto the washer thoroughly, locking the spring and firing pin to the rear of the breech mechanism.

Thread a nut on the firing pin threads, which are hopefully still intact. Place two heavy washers on the pin and lock them in place with a second nut and flat washer. These washers give the user a place to grab while providing enough shaft weight to pop a 40mm primer. Try the mechanism on empty, primed 40mm cases. It is sometimes difficult to find springs with sufficient force that, when attached to the firing pin shaft, will consistently set off the primer. Adding mass to the shaft facilitates the process.

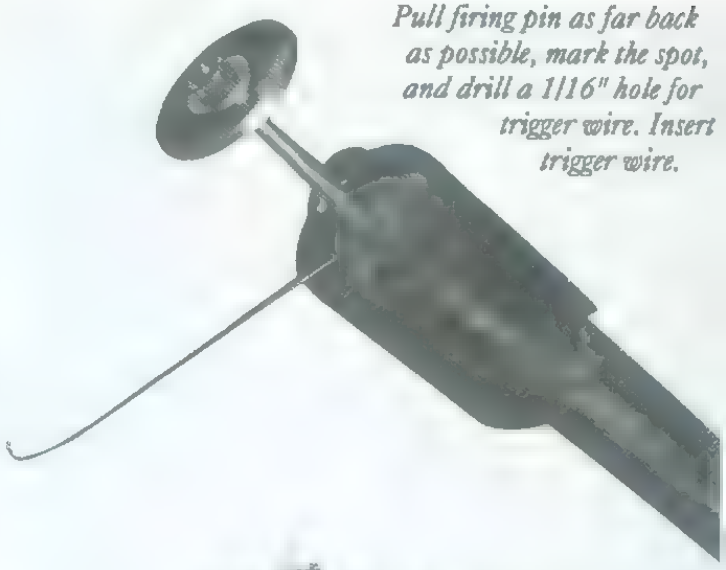
The best trigger is a simple wire-pull affair. Drill a small 1/16-inch hole in the firing pin shaft at the spot where the pin is pulled back to its maximum length. Insert a length of piano wire in

the hole with a loop bent on the other end. Pulling the wire releases the pin, firing the M203.

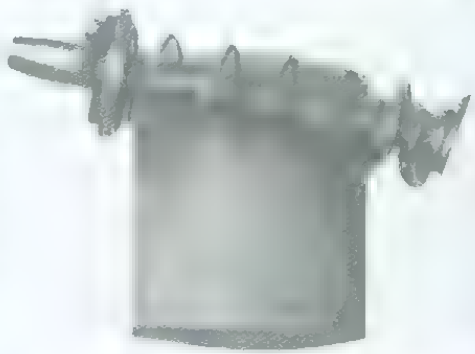
To mount the device on a rifle, cut a 4-inch piece of hardwood block approximately 1 x 1 1/2 x 4 inches long. Using a hand saw, cut a shallow groove to fit the M203 barrel and a narrower groove to fit the rifle barrel. Each rifle will have its own unique block designed to hold the breech piece away from the weapon so it can be reloaded. The block also keeps the 40mm barrel from tilting into the rifle barrel so that one does not shoot the end off the other.

Home-built M203s are a bit more cumbersome than military-issue versions, and the trigger mechanism is not really a trigger as we know it. The device does work, however, and can be extremely effective, lobbing large 1/2-pound grenades out as far as 200 to 300 hundred yards or more.

This home-built M203 *must* be tested first with empty, primed cases and then with military practice rounds. Be absolutely certain the device is reliable before using it to launch homemade explosive rounds.



Pull firing pin as far back as possible, mark the spot, and drill a 1/16" hole for trigger wire. Insert trigger wire.



M203 firing pin removed from breech, showing hole for trigger wire.

The M203 is fastened to a rifle using 1" block of wood with cut groove. Angle the barrel so that one does not shoot the other off. Use three hose clamps to ensure stability.

CHAPTER FIVE

RELOADING 40MM CARTRIDGES

Care and feeding of home-built 40mms has become easier and more fun since the government simplified the design of its cartridges. Newer, slicker nylon cases are ridiculously easy and relatively safe to reload, whereas older, all-aluminum cases were a terminal pain to reload. The process was not impossible, just impractical. Nonetheless, information relative to reloading aluminum cases is included for those who may find themselves caught in Afghanistan with no nylon cases loaded, though the technique is definitely stopgap.

The only trial in the reloading process, if in fact there is one, is that it is much easier for the person who already understands powders, pressures, and primers and who also has a basement full of reloading gear.

The second part of 40mm education comprises building explosive warheads. This chore is not possible without a good, general working knowledge of commercial and expedient explosives. As is true with loading the cartridge propellant, one must be in possession of the correct components to make even very simple warheads work. These components include commercial dynamite, fuze, and caps. Even if the ham 40mm operator sticks solely with black powder and smoke, he will need some sort of reliable commercial fuze in his projectiles.

The following information is prohibitively dangerous for the person who does not already possess good skills and training with explosives.

Starting with 40mm empties, use a small steel punch to drive out the empty .38 blank pressed into the cartridge's rear base. This small brass case, about 3/4 inch long, is held in place solely by friction. It has no mark or designation, unless the nylon case has been previously reloaded by another user and the original is no longer present. An access hole through the nylon high-pressure dome allows one to place a punch on the back of the .38 blank while the 40mm cartridge is placed in the partially spread jaws of a vice to allow the .38 to pass on out.

If the need arises, standard commercial .38 Special or .357 brass can be used in place of the GI brass. Before use as 40mm primers, however, commercial cases must be trimmed down by what seems at first like an incredible amount. Commercial .38 Special brass measures roughly 1 1/4 inch in length. A full 3/8 inch must be cut away with a file or case trimmer, leaving the case a short 3/4 inch in length. Run the brass through a sizing die, decapping it in the process. Recap with a fresh, small pistol primer of any commercial origin.

Primed, sized commercial brass does not seem to hold in the nylon case as well as the original issue GI type. If it is too loose, wrap a layer

of tinfoil around the case to bush it up a bit.

Should the 40mm reloader have the time and money to tear down a factory-new load, he would find that the propellant contained in the diminutive .38 blank is about 6 grains of gray flake circular powder. In some regards it looks a bit like Bullseye. This powder may indeed be standard Bullseye, but it may also be generic blank-type powder, the exact composition and nature of which is impossible to know without scientific instruments.

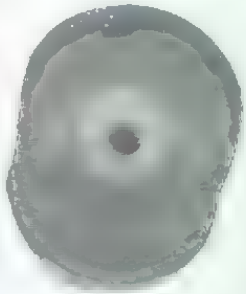
After sizing and priming, the little case will hold about 9 grains of Herco or any other common shotgun powder. Range over which the projectile is thrown is adjusted by changing the type of powder placed in the propellant cartridge. It seems impossible to overcharge the load as long as no powder is loaded beyond that which the short .38 blank will hold.

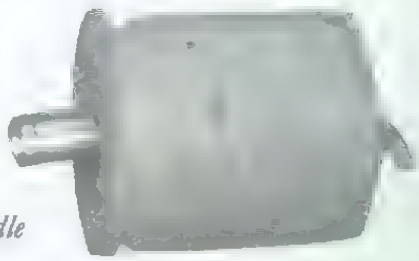
Nine grains of Herco produces a load that will throw an 8-ounce projectile about 200 yards. A similar charge of Unique will earn the user a full 300 yards. Bullseye produces just about factory specs, throwing an 8-ounce projectile an amazing 400 yards. None of these loads seemed to threaten the homemade 40mm devices.

Engineering behind 40mm rounds is such that the high-pressure chamber (the nylon dome in the center over the .38 cartridge) bleeds the gases off into the cartridge body before they start to work on moving the projectile. Overall internal pressures are very low. Because of this design characteristic, it is extremely difficult to determine when pressures are getting too high using conventional handloading methods.

Aluminum cases can be reprimed and recharged by prying out the expended primer with an ice pick. Clean out the flash hole with a small drill or piece of wire. Turn the case over and wrap a piece of tinfoil around the center high-pressure dome. This will plug the holes in the dome, allowing the reloader to trickle and push a few grains of powder into the case from behind. Use Bullseye and try to poke as much as possible into the primer hole. In my experience, it is impossible to push too much powder into the high-pressure dome.

Improvements in 40mm technology, including the use of nylon cases (above), have made reloading for grenade launchers very easy.





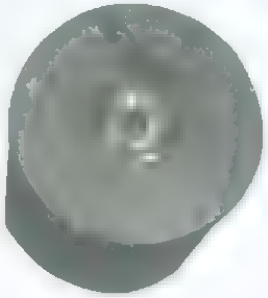
Both aluminum and nylon 40mm empties are available to the reloader. Nylon cases, with their access hole, are easier to handle (above). Partially extracted .38 round (right.)

A .357 round, left, compared to .38 blank round used to propel 40mm grenades, middle, and .38 Special brass, right.

Factory original .38 propellant cartridge pulled from 40mm practice round. Load contains 6 grains of gray flake powder.

Recharged .38 short brass holds 9 grains of powder. Wad is toilet tissue and Elmer's Glue (left).

Charge cartridge in nylon case (below, left) is easy to punch out. Primer in aluminum case (below, right) must be pried out with an ice pick.



HE, practice, smoke, and HE 40mm rounds (below).

An accurate kitchen scale will allow the 40mm reloader to know when the projectile's weight has reached 8 ounces.

Place a fresh primer over the primer hole and seat it with a nylon hammer. There is some danger from premature detonation at this point, so exercise caution. Once the round is reprimed and recharged, producing a warhead for the aluminum cases is exactly the same as with nylon cases except for the former's larger diameter, which provides for a slightly larger projectile.

After filling the blank cartridge with powder, place a double layer of toilet paper over the powder and secure it in the cartridge casing with a generous dollop of Elmer's Glue. Reprimed, reloaded cartridges can usually be pushed back into the nylon case by hand. If not, tap them in with a nylon hammer. You are now ready to insert appropriate warheads.

Projectiles can be anything from C-4 to buckshot. Weapons of this nature ideally lend themselves to throwing 8 ounces of whatever the owner desires across the countryside. The only caveat is that the projectile must never weigh more than 8 ounces. Some 40mm military loads weigh up to 9 ounces, or 277 grams. At 8 ounces, or slightly less than 227 grams, the maker has a margin of safety. To be on the safe side, one might want to reduce this maximum a small amount. This weight must include the total of fuze, blasting cap, projectile case, contents of the case, and the end closures, which can be fairly heavy by themselves. Eight ounces does not sound like very much, but when one is packing in C-4, chlorate powder, or some other explosive active ingredient, it is actually quite a potent package.

Start the process of manufacturing warheads by investing in an accurate spring balance scale. It is imperative that the maker has a good, reliable indication as to when the sum of the the components are pushing the 8-ounce limit. High-quality kitchen scales, usually available at a relatively modest price, will often work satisfactorily. If possible, check the accuracy of the little kitchen scale using a larger, more accurate arm-balance model. If this is not possible, tolerances

built into the process will accommodate some margin of error.

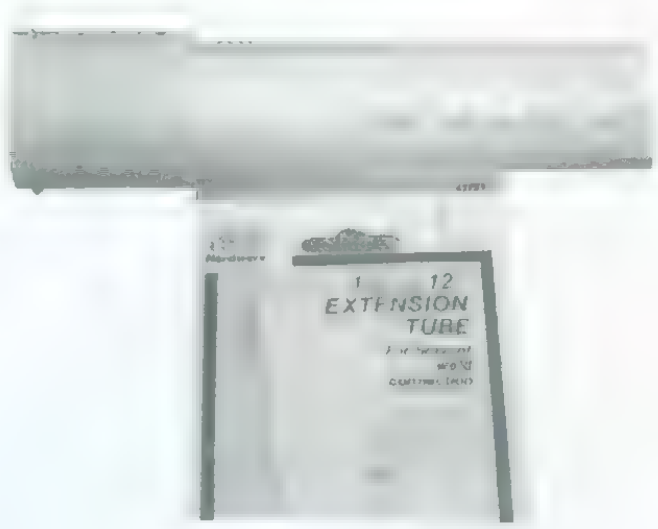
Use an appropriate length of 1 1/2 x 12-inch plastic drain extension pipe, used to connect sinks and toilets to waste disposal pipes, for the projectile housing. Plastic drain extension pipe is fairly tough to find and is also quite expensive, yet there is no other off-the-shelf tubing that comes close to working as well as this material. Plumbing shops often have the entire drain trap rather than single plastic extension tubes, and they tend to handle only metal drain traps. If it is otherwise impossible to find the correct tubing on your own, ask for part number 43793 at an Ace Hardware store.

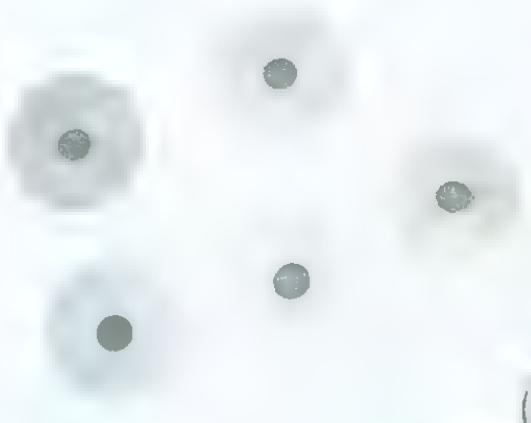
Other types of plastic pipe available on the market are either too large or too small to fit snugly into the 40mm casings. Small pipe can be bushed with plastic tape, and large pipe can be ground down to some extent, but this 1 1/2-inch drain extension pipe works very well with no other adjustments, fitting nicely into the barrel of a 40mm device. If the maker is overgenerous with sealing glue the fit may never get snug, but generally everything slides together just right.

Depending on one's design loading, it is possible to construct either one large (10-inch) or two standard-sized (5-inch) projectiles from a single 12-inch piece of extension tube costing about $2.50. Two inches of the tube at the fitting is consumed as nonproductive waste. This leaves 10 inches of pipe with which to house the contents of a 40mm projectile.

While at your hardware or plumbing shop, purchase two 5/16-inch fender washers for use with each 5-inch projectile. These washers measure about 38 millimeters in diameter, or just a shade less than 1 1/2 inches. They will slip into a 40mm barrel or down into an empty nylon case quite easily. (As mentioned, aluminum cases have a slightly larger inside diameter, but these will seldom be used by the reloader.) The 5/16-inch center hole of these washers is a tinge large for the purposes at hand, but it is workable, especially compared to other off-the-shelf parts available.

Next, decide which type of warhead you wish to play around with—explosive, smoke,

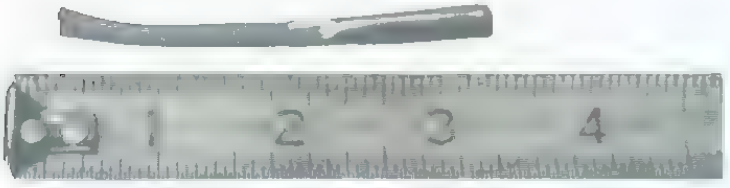


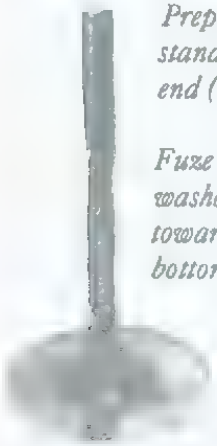


One 5" segment has been cut from this piece of drain extension pipe, leaving the fitting (not usable) and one more 5" segment. Package designation gives hardware store codes (top).

5/16" fender washers used to close projectile ends and contain fuze assembly (middle).

Fuze, propellant case, charge, and end washers are piled on the scale to be sure 8-ounce limit is not exceeded (right).





Prepare the time fuze by cutting 2 1/2" of standard dynamite fuze. Cap the fresh-cut end (top).

Fuze assembly securely glued to 5/16" fender washer. This assembly, with exposed fuze toward propellant charge, will be glued to bottom of projectile (left).

Fill 5/16" hole on fender washer with glue. Securely glue finished assembly to tube to complete explosive projectile.

black powder, white phosphorous, shot, or whatever. Measure out the correct amount of material on the spring balance along with the front and rear washers and the fuze and cap assembly. Usually this will require a plastic pipe length of about 5 inches when used with materials such as C-4 or commercial dynamite. (Eight ounces of C-4 really packs a wallop—the round is a real crowd pleaser whenever it is deployed.) A mixture of powdered charcoal and sulfur, when used as a smoke grenade, will fill 7 inches of tubing.

Standard commercial dynamite fuze burns at a rate of about 5 seconds an inch. Cut 2 1/2-inch lengths of fuze from the coil and crimp a dynamite cap onto each freshly cut end. When everything is calculated, allowing for split end and possibly an overly rapid burn, this little bit of fuze will detonate the cap in about 10 seconds.

Ten seconds is too long an interval for military applications but will work very nicely in a commercial/paramilitary situation. It takes about 2 to 3 seconds for the projectile to reach the ground after being launched, leaving a 7- to 9-second interval while the projectile lies on the ground with its fuze sputtering. Anything shorter is overly dangerous.

Theoretically, an adversary could throw the bomb back at the launcher. In actual practice, however, this seems unlikely. The Bad Guys may have time to run away, but this is probably an acceptable result, as it would expose them to small-arms fire.

Using a small knife or razor, finish the fuze assembly by splitting the fuze back about 3/8 inch on the capped end and spread the two halves apart. Using a reasonably fresh bottle of contact cement, glue the fuze halves solidly to one of the 5/16-inch fender washers. Allow the capped end and a small segment of fuze to protrude through the hole vertically. As much as is possible, keep the glue between the uncut fuze segment and the metal washer—do not rub it on or otherwise cover the exposed powder train in the center of the split fuze. You want to expose as much of the cut fuze to the heat of the launching charge as is practical.

The fuze poking through the 5/16-inch washer will not occupy the entire open space in the washer's center. Using any combustible glue such as Goop, Duco cement, or contact cement, fill in the remainder of the hole solid. This is done so that the heat from the launching blast lights the fuze but does not flash into the canister, exploding the contents inside the barrel.

Place a tiny dab of contact cement in the center of the split fuze as near to the raw powder train as possible, and place a newly cut match head in the fresh glue. Heat from the .38 cartridge will light the match head, which in turn should light the fuze.

Theoretically, it should not be necessary to use match heads to assist the process. But in actual practice, the biggest single problem with these homemade projectiles is getting the fuze to light reliably. Adding a match tip or two ensures that the warhead is more reliable.

A second problem is the fact that the projectiles tend to break apart on arriving back on earth. It isn't quite necessary to build them like

the proverbial brick outhouse; almost that sturdy is usually sufficient. Using any heavy-bodied plastic glue, fasten the washer with fuze and cap assembly onto the plastic cylinder. Glue carefully and well, allowing sufficient time to dry.

After the washer cap/fuze assembly dries in place and is securely fastened to the plastic tube, fill the tube with whatever material is appropriate. Several options are listed below; others depend on the user's ingenuity. Finally, after filling the 5/16-inch hole with glue, glue a washer on the open end to seal in the canister's contents.

A canister packed with match heads and detonated by a dynamite cap is extremely flashy. This loading could be lethal if fired through the window of a building. At 8 ounces, one of these projectiles would pass through a window with impunity, doing all sorts of damage inside.

Mixing common sugar chlorate powder with finely powdered aluminum (as used to seal automobile radiators) produces a bright flash, pleasing thump, and a copious amount of smoke. It appears as though this loading might produce a suitable stun grenade.

Straight 40-percent dynamite can be homemade by kneading fine-ground potassium chlorate into an equal volume of Vaseline. This is an explosive but at 8 ounces not a very enthusiastic one. Better to use commercial 60- or 80-percent dynamite or homemade C-4, the blast from which can be felt in one's face even at 200 to 300 yards.

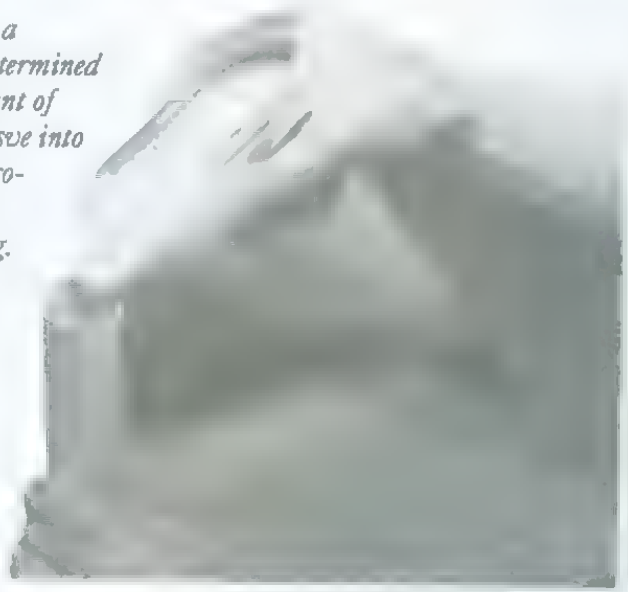
Seven-plus ounces of black powder in a projectile produces a spectacular yet questionable effect. When using black powder, do not use a dynamite cap in the fuze package. Instead, glue a match head to the lower burn-down end of the fuze. In the event the burning fuze itself is not vigorous enough to set off the black powder, the match head will do the job. Use the coarsest powder available: 1F rifle powder is the minimum, but use 3F black cannon powder if it is available. Results are reasonably good, but the price per round for the limited amount of destruction produced seems prohibitive. It is not possible, for instance, to get three full-power shots from a single $10 can of black powder!

Carefully glue a match head to the center of the exposed fuze, which has been sliced open 3/8" on the end. The fuze is lit by the propellant cartridge.

Home construction of a very nice napalm round is possible using commercial jelling agents to harden a mixture of diesel fuel and gasoline. Place about 7 1/2 ounces of the syrupy mixture in small Zip-Lock bags and stuff one or two bags into a plastic 40mm projectile container. Charge the projectile with 2-inch fuze and dynamite cap in the usual manner. Seal up the ends as securely as possible with washers.

These are showy, spectacular rounds when they function properly, but premature detonation, unreliable detonation on contact, and problems with the case popping apart on impact limit their usefulness. Also, these rounds virtually must be prepared within the hour before their natural deployment, since their "belt life" is quite short. If one knew he had a building to torch and wanted to accomplish the job from 400 yards out, it might be possible to build the rounds ahead of time. Usually it is not possible to predict which targets will be best attacked with what type of warhead.

There is some interest in firing buckshot from a 40mm device. Because of the "limited" amount of power one can



Pour a predetermined amount of explosve into the projectile casing.

squeeze from 9 grains of propellant, most 40mm shot rounds range from really wimpy to completely unsatisfactory. At the very most, one can only load up an ounce and a half of buckshot in a plastic pouch taped to the 40mm case. At 60 yards the individual pellets can be caught in a first baseman's mitt.

If use of a shot load is important to the 40mm owner, I suggest making a bushing or insert that will allow the use of a 10- or 12-gauge shot shell. A functional 12-gauge insert can be made from a piece of 3/4-inch steel pipe along with common steel washers, with little wear and tear on the builder.

Several commercial suppliers offer smoke-producing pellets that, when packed into a projectile with the correct detonator, produce an effect much like phosphorous.

All military rounds will function in one's home-built 40mm device, with the exception of high-explosive rounds. American military HE rounds will always have a gold-colored projectile with "HE" stenciled on both the projectile and the case, and are therefore easy to identify. Since home-built 40mms are not rifled, it is difficult to predict how a regulation HE round would react being fired from one. My feeling is that attempting it constitutes more risk than even a 40mm owner would care to accommodate.

It is possible to construct fairly reliable point-detonating rounds at home. They are extremely dangerous, however, and should be considered only in the most desperate paramilitary context. If this is your situation, proceed as follows.

Military HE rounds are spin activated and will not function in a home-built device. HE rounds have gold-colored projectiles and are plainly marked HE.

Use two 5/16-inch fender washers and the regular 1 1/2-inch plastic projectile pipe. Glue the hole shut on one of the washers and secure it to the plastic pipe with a sufficient amount of glue. Fill the pipe about 7/8 inch through with suitable explosive. Grind down the second fender washer so that it will slip into the top of the plastic pipe. Ream out the 5/16-inch hole so that the washer will just about accommodate a .38 Special case. Fill the case with Bullseye powder and seal with toilet paper and glue. The .38 case will hold about 22 grains of powder.

Insert the loaded .38 blank in the washer and snug the washer down on the explosive. Be certain the .38 is buried full length in the explosive material and that the explosive is firmly compressed under the washer. Cut an eightpenny nail so that, with the tip on the .38 primer, it protrudes about 3/8 inch out of the end of the projectile. Sharpen the tip of the nail, solder the end to a 1/4-inch fender washer, and place the finished washer assembly in the top of the projectile. It should protrude about 1/8 inch from the top end of the plastic case with the nail resting on the .38 primer.

Using a single layer of cellophane tape, affix the washer/nail detonating assembly to the projectile. A tap on the washer should drive the nail into the primer, detonating the projectile. It is imperative that one not drop or roughly handle the round. In actual use, the round detonates fairly reliably.

Use of point-detonating rounds carries more danger than the average M79/M203 owner customarily wishes to accommodate. My suggestion is to use only fuzed HE rounds.

Forty-millimeter rounds are a bit convoluted and expensive to produce at home. Yet more than any other military large bore, it is practically possible to turn out a variety of credible ammunition types. After a few evenings' work, the reloader can have a blast when Sunday shooting time comes 'round.

CHAPTER SIX

COMMERCIAL SUPPLIERS

An 800-pound 25mm French Peteaux cannon does not seem to have a great deal in common with 40mm grenade launchers. If nothing else, the rubber tires and armor plate set it apart. In many respects, however, a 40mm is the more interesting of the two.

It is markedly easier, for instance, to load for a 40mm grenade launcher than for a 25-mm Peteaux cannon, especially if one is primarily interested in the more spectacular high-explosive rounds. Forty-millimeter HE rounds of various types are relatively easy to make. They produce a nice, showy detonation at their maximum 400-yard range that always impresses the crowd. We eventually did manage to manufacture HE rounds for the Peteaux, but the results were lethargic. Point detonation was accomplished using .22 rimfire blanks as detonators, but the rounds held an insignificant amount of high explosives. As far as I know, Interarmco never imported factory-made HE rounds for the Peteaux.

It took us three or four weeks to steam clean and paint our newly arrived Peteaux. A local machine shop made a new firing pin without undue delay, though it took quite a while to figure out how to drop the breechblock from the weapon and withdraw the damaged pin.

Finally the great day arrived. Everything was painted up and repaired. Without additional ceremony (which, in retrospect might have been appropriate), I hooked the cannon ring to the hitch on my jeep. It pulled reasonably well down the road, stopping traffic in an admirable fashion. Marion Wilcox had recently cut and baled the alfalfa field next to his house, providing a nicely groomed, golf-course-clean playing field comprising a 600-yard straightaway over which we could shoot. At the back of the field, three wild cherry trees provided an excellent point of aim.

Neither of us really thought that we could actually hit one of the trees at that range. It was the old quarry behind them that we hoped to hit. Later, when we became skilled at it, any one of us could hit a 55-gallon barrel three for three at 900 yards. One can become amazingly proficient with large bores, a truth we had not yet discovered. But on the first shot, everything was a question. Would, for instance, 6 feet of sodded soil bank stop an errant Peteaux round?

Smoothly, yet forcibly, I cranked the handle, dropping the cannon's breechblock. It was relatively easy to sit behind the massive machine and peer up the barrel to bore-sight it. Using the lateral and horizontal wheels, I was able to bring around the point of aim to the center of the hapless cherry trees. By mutual consent, we chose the middle tree as the target—a fact that later became something of a sticky issue. At 600 yards,

the tree trunk nicely filled the 1-inch bore.

French GIs probably thought nothing of opening the sardine-like sealed metal cans containing their ammo. For us it was like a final band chorus before the girls came out to dance. In spite of forty or more years of storage, the individual rounds were still clean and bright. One slid easily into the breech, pushing the ejection forks forward, which, in turn, slammed and locked the breech.

It was show time. One could easily fantasize about panzers on the Maginot Line.

One fires a Peteaux by sitting on the left tail and squeezing a trigger mechanism mounted on the horizontal traverse wheel. I squeezed the trigger. The gun bounced like a Russian tumbler.

Downrange, things happened very quickly. The trunk of the cherry tree vaporized instantly at the exact point of aim. Severed trunk and branches jumped upward, leaving a great splintered, shattered lump in the tree's place.

Pieces of trunk, trees, limbs, and bark rained down around the poor old cherry stump. Not only was a potentially valuable tree destroyed, we had to spend the rest of the afternoon raking up the severed limbs and leaves. Wilted wild cherry is poisonous to livestock, and I did not want to be responsible for Marion's holsteins that frequented the area.

Our lesson for the day? In spite of occasional miscalculations, shooting big bores is very entertaining. During the early and mid-1960s, it became so entertaining that a number of suppliers, catering specifically to large-bore shooters, opened for business. Given our current legislative and psychological climate, however, those who supply big-bore shooters today find it best to remain inconspicuous. Yet they are out there in sufficient numbers. All one need do is look behind the headlines to find what is needed.

For those who wish to go the whole route purchasing a new M79 or M203, this is the man to call on:

Jonathan A. Ciener
6850 Riveredge Drive
Titusville, FL 32780

Ciener has built quite a reputation for himself within the Class III gun fraternity with his excellent silencers. He is now on the cutting edge of the destructive-device movement and is a wealth of information regarding transfers, licensing, and use of DDs. If you can catch up with him, Ciener is one of the best sources of information.

The other prominent DD dealer in the United States is:

* Jim Pondraff
21131 Parktree Lane
Katy, TX 77450
713-667-1872 ?

Pondraff, like all good hobby-store proprietors, hands out large quantities of good advice on his toys to get people into the field. He deals in 40mm devices of all kinds, as well as mortars, cannons, and ammo.

For surplus military parts, try:

* Jerome H. Bachman
MDA, Inc. David
1025 Chili Avenue
Rochester, NY 14611 703-799-0836
~~216-473-5562~~ M60E3
716-328-7870

Mr. Bachman has, in times past, had the largest supply of surplus parts for M79s and M203s. Generally, he has tried to market these parts in lots, at tens of thousands of dollars per lot. Often, some key part is missing from these lots, so that complete units cannot easily be assembled from his offering. If he doesn't have the missing part in stock, he did have it at one time and would probably respond to a note asking who might have it now.

A.C. Products is the place for the skilled machinist who needs nothing more than a set of drawings with which to manufacture an exact replica of an M203. Their address:

* A.C. Products
Box 85
Rockledge, FL 32955

Every DD owner/user needs a firm like Rock Island Armory to provide unusual cases and projectiles. Whenever I have been in dire need, they have come through like gangbusters. They provide exceptional service at reasonable prices on 40mm empties. At the time of this writing, they did not have a steady supply of factory-loaded 40mm ammo, but that was changing fast. A quick phone call will confirm their inventory by a knowledgeable, cheerful, helpful salesclerk. Order with complete confidence from these people.

Rock Island Armory, Inc.
911 West Main
Geneseo, IL 61254

One hopes that, with the reprinted military manual included, more than enough information is included in this book relating to 40mm devices. If not, try writing:

Delta Manuals
Box 1751
El Dorado, AR 71730

They have a diverse offering of new and obsolete U.S. military manuals.

TAPCO features an exact replica of an M203 in 37mm! Because no explosive rounds have ever been manufactured for 37mm, the device is sold as a simple flare launcher. Reportedly, none of the parts contained in this very authentic-looking device are interchangeable with an issue M203. Flare cartridges are available from TAPCO, which probably can be reloaded using information in this book. Genuine M203s run about $3,500 each, not including the transfer tax—TAPCO sells its 37mm version for less than $400 complete. Their address:

TAPCO
Box 575
Powder Springs, GA 30073

G.I. Parts has dealt in 40mm launcher parts on a single-order basis (as opposed to buying in lots) for a number of years. They do not always have on hand all of the parts necessary to complete an M79 or M203. Its ammunition offerings are more diverse than other companies and are generally reasonably priced. Almost every supply house has the common orange-die practice rounds, but these people have more than that.

* G.I. Parts Co.
Box 2518
Kensington, MD 20895

For a mere $2, the people at Phoenix Systems will send a catalog crammed full of odd items that could only appeal to DD nuts. These include a variety of 26.5mm flare canisters that should be usable in 27mm weapons, common parachute grenades, 12-gauge flare cartridges, smoke pellets for reloading, mortar rounds, practice rifle grenades, grenade blanks, tracer ammo, and many other items too unusual to mention. Although prices seem high at times, it would be difficult to imagine life in the DD world without this little 56-page booklet. Order one from:

Phoenix Systems, Inc.
Box 3339
Evergreen, CO 80439

Dangerous Dave is the senior guru of large-bore military blasters. He has either seen it all or done it all. In years past, tons of interesting material has moved through his store, ranging from 8-gauge magnum shotguns to 37mm Bofors antitank cannons. It is unclear what the Old Western Scrounger's status is now that California has gone ballistic. Even if the state does completely collapse, people like ourselves will be going to Dangerous for hard-to-find powder, primers, brass, and counsel based on his long experience.

* Dangerous Dave
Old Western Scrounger
12924 Highway A-12
Montague, CA 96064

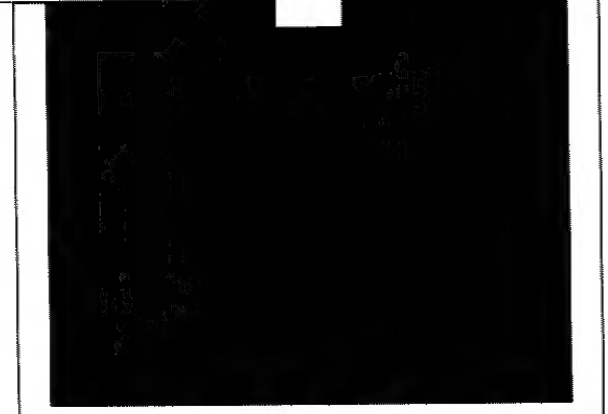
F.J. Vollmer is one of the only large full-service DD dealers that consistently advertises 40mm grenade launchers and requisite ammo. Reportedly, his ammo is of new manufacture, done on contract by government suppliers. In lots of 75 rounds per case, his prices are the best that are widely advertised. Most home builders are advised to start with at least a case of practice ammo to test their creations.

* F.J. Vollmer & Co., Inc.
  #3 Towanda Road
  Bloomington, IL 61701-3485

SARCO is an old-line military surplus parts house with so many different items in inventory that no one knows the full extent of their holdings. From the golden age of surplus to the present, they have carried rifle grenades, recoilless rifle practice rounds, barrels, stocks, hand grenade bodies, and numerous other parts and ammo. Many of us have relied on SARCO for years. In the past, they have had 12-gauge inserts for M79s, extra barrels for both the M79 and M203, and 40mm cartridges. When all else fails, it may pay to give the whiz kids at SARCO a call to see what they have lying around in the corner of one of their many parts bins.

* SARCO, Inc.
  323 Union Street
  Stirling, NJ 07980

Undoubtedly I have neglected someone who has helped me with destructive devices down through the years, but the neglect is inadvertent. As DDs become increasingly popular, other suppliers will come forward whose names should be added to this list. Those who know of places to pick up these kinds of items can drop me a line in care of Paladin Press telling me of their favorite vendors.



CONCLUSION

In the Good Old Days it was called torpedo gravel. People in our day have no idea that there once were fireworks called "torpedoes" commonly available. Kids celebrated the Fourth of July by throwing the torpedoes around, delighting in the rousing report they made when they hit something solid.

Risk avoiders in our society banned them early on. Fourth of July torpedoes really were risky, but not nearly as risky as going to war over freedom and independence, which was the reason behind the holiday.

My first big-bore experience consisted of taking 2-foot lengths of 1-inch pipe and driving them 8 inches into the ground. My brother and I placed the primitive, makeshift mortars under mulberry trees, where millions of blackbirds roosted, ate mulberries, and defecated on the land below. At night, when the blackbirds had settled, we crept in like adulterous Indians to our preplanted "infernal machines." It had to be dark as an undertaker's pocket so that neither the birds nor our mother saw us.

I would light a silver salute and plunk it into the pipe. Brother scooped a handful of torpedo gravel out of a sock and dumped it down on top of the giant firecracker. If we were very fortunate—or the birds were extremely unfortunate, depending on one's point of view—we sometimes found a second pipe in the dark and were able to drop a second fizzling salute down the hatch while the first contemplated detonation.

Our results reminded me of the German couple with four sets of twins who lived down the road. My dad asked the woman if they always got twins. "Oh, no," she responded, "sometimes ve get noting!"

So it was with the blackbirds. Sometimes the gravel knocked down two or three. Most of the time we got nothing. It was, however, always fun and interesting to try.

Obviously the level of what constitutes fun and interesting has shifted dramatically with the passing of years. As I pointed out earlier, the U.S. government has done military big-bore shooters a tremendous favor by engineering and developing a system that is so high-tech it's low-tech.

Forty-millimeter systems are wonderfully simple. Virtually anyone anywhere can construct both weapons and ammo in his workshop. It would be a greater chore if the maker found it necessary to produce empty cases, but that genie is already out of the bottle, since we have sufficient 40mm cases in circulation.

At this writing, Soviet political bosses have discovered that if one wishes to rule over a large population, a large, expensive, well-armed standing army is required. Yet as a result of large numbers of soldiers standing around in large numbers

of places, leakage of significant numbers of weapons will result. In places such as the Ukraine and Azerbaijan, the Soviets found that their citizens had easily scrounged a sufficient number of weapons, mostly from the army.

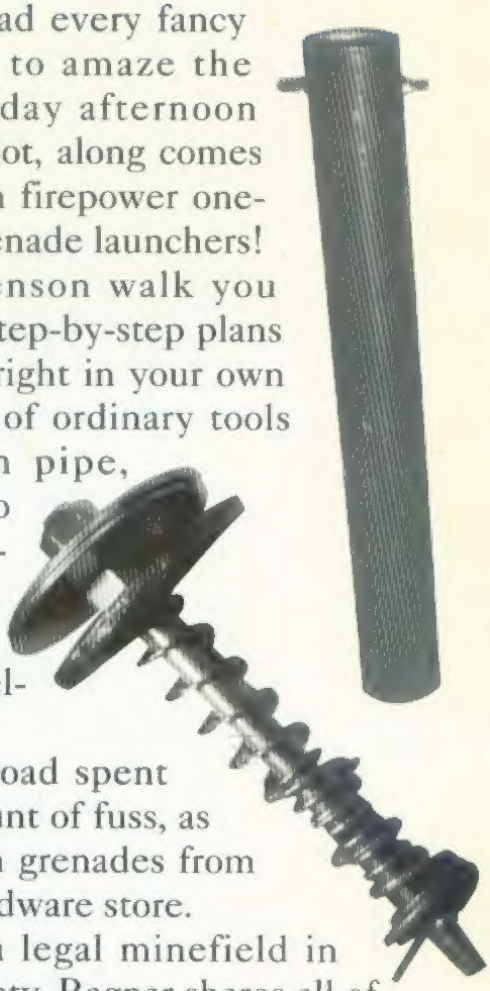
The syndrome is not limited to the Soviets. In many places near military bases in the United States, there are so many loaded 40mm rounds floating around that it's not cost effective to reload.

Licensed destructive-device dealers attest to the fact that the sport is gaining wide acceptance and favor. Shooting 40mm is not only fun, it is relatively easy. Currently, our laws regarding DDs appear to be some of the fairest in the world.

I hope this brief explanation and how-to will add to the enjoyment of our nation's shooters.

Just when you thought you had every fancy firearm and customized gizmo to amaze the gawkers at those informal Sunday afternoon weapons demos down at the sandlot, along comes Uncle Ragnar with the ultimate in firepower one-upmanship—homemade 40mm grenade launchers!

That's right, let Ragnar Benson walk you through these remarkably simple step-by-step plans for constructing an M79 or M203 right in your own home workshop. With a handful of ordinary tools and nothing more exotic than pipe, washers, nuts, and bolts, you too can soon be lobbing out show-stopping high-explosive ordnance to the delight of astonished civilians and the admiration of fellow destructive-device junkies.



Ragnar also shows how to reload spent 40mm cases with a minimum amount of fuss, as well as how to improvise your own grenades from common materials found at the hardware store.

Lest you fear treading into a legal minefield in today's increasingly restrictive society, Ragnar shares all of the pertinent information he's gathered from legal research and his contacts with BATF.

The final chapter is a list of sources for surplus parts, ammunition, information, and general camaraderie in the wonderful world of destructive devices!

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